REMEDIAL INVESTIGATION/FEASIBILITY STUDY
COMMUNITY RELATIONS PLAN
FOR THE TEST AREA NORTH GROUNDWATER OPERABLE UNIT
AT THE IDAHO NATIONAL ENGINEERING LABORATORY

May 1992

Idaho National Engineering Laboratory
EG&G Idaho, Inc.
Idaho Falls, Idaho 83415

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCA	Consent Order and Compliance Agreement
CRP	Community Relations Plan
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Field Office
EPA	Environmental Protection Agency
FFA/CO	Federal Facility Agreement/Consent Order
FS	feasibility study
HWMA	Hazardous Waste Management Act
ICPP	Idaho Chemical Processing Plant
INEL	Idaho National Engineering Laboratory
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
TAG	Technical Assistance Grant
TAN	Test Area North
TRA	Test Reactor Area
TRU	transuranic
USGS	United States Geological Survey
WAG	waste area group
WEC	Westinghouse Electric Corporation
WINCO	Westinghouse Idaho Nuclear Company

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(DRAFT)

1. OVERVIEW OF COMMUNITY RELATIONS PLAN

1.1 Introduction

The Idaho National Engineering Laboratory (INEL) has been designated as a "Superfund" Site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). With this designation comes the responsibility to (a) investigate areas suspected of being contaminated in the past, (b) identify alternative solutions for remedial action, (c) involve the public in each step of the investigation and decision-making process, and obtain consent from state and federal regulators, and (d) follow up with the best course of action for environmental restoration.

1.2 Community Relations Plan

This Community Relations Plan (CRP) has been taken from the interim plan developed by the Department of Energy Idaho Field Office (DOE-ID) in March, 1991. This plan has been written specifically as a supplement to the Test Area North Groundwater remedial investigation/feasibility study (RI/FS) Work Plan. Activities conducted under this plan will be integrated with activities being done under the installation-wide Community Relations Plan where feasible. Changes or additions to both plans will be coordinated with INEL community relations personnel. Both plans will be used to establish a process to help DOE-ID, the Environmental Protection Agency (EPA), and the State of Idaho Department of Health and Welfare (IDHW) communicate information to the public and to help the public communicate concerns back to DOE-ID, EPA, and IDHW. These communications are intended to inform and involve interested citizens, public officials, agencies, groups, and organizations in the State of Idaho on the TAN Groundwater RI/FS.

1.3 Objectives

The RI/FS Specific Community Relations Plan has specific objectives for accomplishing remedial investigations at TAN. They are to:

- Address concerns expressed by the community during interviews and public meetings
- Comply with legal requirements of CERCLA and the National Environmental Policy Act (NEPA) as required by DOE-ID policy
- Provide the public with accurate and understandable information on the RI/FS and related remediation work at TAN
- Establish two-way communication with the public to achieve community involvement
- Provide an opportunity for the public to become involved in key decisions regarding the RI/FS and related remediation work.

Since the Community Relations Plan is intended to be a "working" document, it can be amended to provide additional community relations activities as needed.

1.4 Agency Contacts

A current list of officials from the DOE-ID Environmental Restoration Division, the INEL Community Relations Plan Office, the INEL Public Affairs Office, EPA Region X, and the Idaho State INEL Oversight Program is shown in Appendix A. Representing various offices and agencies, these individuals have a common interest in the activities described in this Plan, which is to ensure public involvement in remedial activities at the TAN.

Inquiries or comments concerning any aspect of these INEL environmental investigations, including monitoring and remedial activities, or the content of this Plan, can be directed to the federal and state regulatory agency contacts listed in Appendix A or to the following address:

Environmental Restoration Division
DOE Idaho Field Office
785 DOE Place
Idaho Falls, ID 83402

2. SITE OVERVIEW

2.1 Site Description

The INEL is located in southeastern Idaho near the center of the eastern portion of the Snake River Plain. The INEL encompasses 890 mi^2 of semi-arid land near the Lemhi and Lost River mountain ranges. The nearest city with a large population center is Idaho Falls, located about 45 mi to the east. INEL employment at the present time is about 11,000 persons. Most employees live in Idaho Falls. Others live in the surrounding areas of Pocatello, Blackfoot, Rexburg, Arco, and other nearby towns. The TAN facilities are located in the northeast section of the INEL. A more detailed description of the TAN area is found in Section 2 of the RI/FS Work Plan.

The eastern Snake River Plain is an area of complex geologic structure and history. Studies show basaltic lava flows to a depth of at least 2,440 ft. The flows are interbedded with cinders, silt, sand, and clay. The basalt has high permeability resulting from fractures and joints. Age-dating techniques estimate the youngest basalt at INEL to be between 45,000 and 145,000 years old.

The principal groundwater feature at INEL is the Snake River Plain Aquifer, a continuous body of groundwater underlying most of the Eastern Snake River Plain. The aquifer consists of basalt flows with sedimentary interbeds. The depth from the surface of the ground to the top of the aquifer at TAN is about 200 ft. Most of the water pumped from the aquifer in the TAN area is used for domestic and industrial purposes.

2.2 Historical Sketch

2.2.1 Management of INEL

INEL is managed by the Idaho Field Office of the Department of Energy. The mission of DOE-ID is to provide the engineering disciplines necessary to support nuclear safety; reactor development, operations, and training; spent nuclear fuel materials processing; waste management and technology

development; environmental remediation; energy technology and conservation programs.

Over the years, a number of private firms have provided specific support services for DOE-ID. At the present time, the operating INEL contractors are EG&G Idaho, Inc., Babcock-Wilcox, Westinghouse Electric Corporation, Westinghouse Idaho Nuclear Company, M-K Ferguson of Idaho, Argonne National Laboratory-West, and Protection Technology of Idaho, Inc.

2.2.2 Historical and Current Projects at TAN

During the early 1950s, work began at the site to develop reactor prototypes for the U.S. Air Force and Navy. The Aircraft Nuclear Propulsion program tested nuclear reactor aircraft engines. The tests were conducted at the Initial Engine Test Facility at TAN. The program was discontinued in 1961 by Presidential Order before the developmental phase was sufficiently refined to install an engine on an airplane.

In 1978, the first experiment was conducted at the internationally famous Loss-of-Fluid Test (LOFT) Facility, the only facility in the world used for total systems simulations of pressurized water reactor loss-of-coolant accidents. Thirty-eight nuclear power tests were conducted on various accident scenarios between 1978 and 1985. The LOFT reactor was inactivated in 1986.

Current activities consist of defense-related work at the Specific Manufacturing Capability and several smaller projects. More details are given in Section 2 of the RI/FS Work Plan.

2.3 Environmental Investigations

Several types of hazardous substances have been produced, stored, and disposed of at the INEL during four decades of operation. Most waste treatment and disposal practices of the past have proven to be adequate. However, some practices that were approved at the time have released hazardous substances to the environment. At TAN, volatile organics and radioactive

waste waters were injected into the Snake River Plain Aquifer. So, one of the main objectives of the RI/FS is to evaluate technologies to remediate the aquifer at TAN.

Figure 2-1 is a map showing the TAN facilities and the injection well used to inject the contaminants into the aquifer. More details on contaminant types, and other site-specific information can be found in Section 2 of the RI/FS Work Plan.

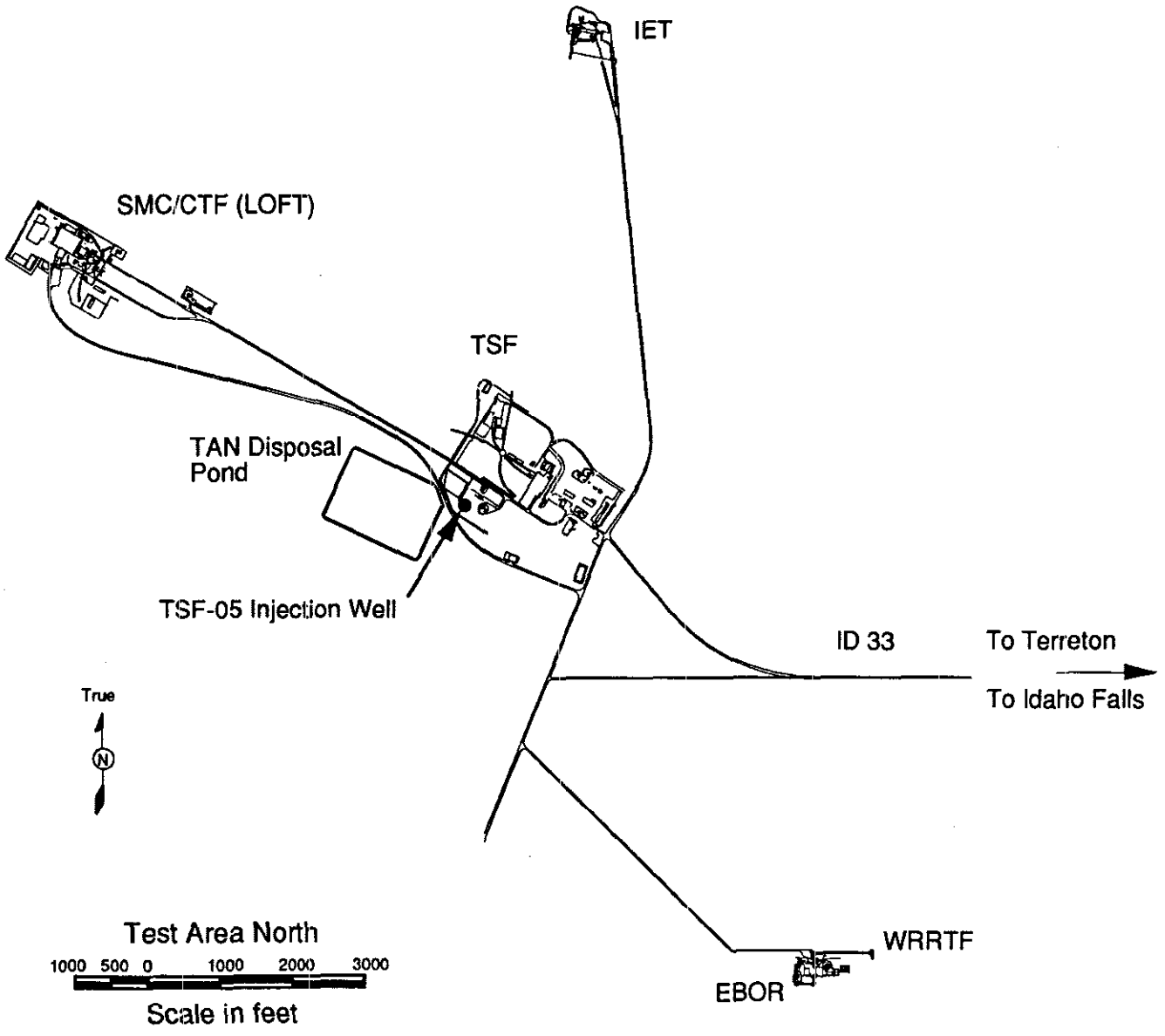

Figure 2-1. Map of Test Area North facilities.

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3. REGULATORY OVERVIEW

3.1 Resource Conservation and Recovery Act, and Consent Order and Compliance Agreement

Originally, the environmental investigation at TAN was conducted under the authority of the Resource Conservation and Recovery Act (RCRA), 42 USC 6901 et. seq. RCRA is a law that regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes. Once volatile organic compounds were found in the TAN drinking water wells in 1986, a corrective action plan for the TAN Groundwater was implemented as outlined in a Consent Order and Compliance Agreement (COCA) between DOE-ID, EPA Region X, and the United States Geological Survey (USGS).

3.2 National Priorities Listing and Federal Facility Agreement

On November 15, 1989, the INEL was added to the EPA's National Priorities List (NPL) under the CERCLA, 42 USC 9601 et. seq., also known as "Superfund," based on the detection of contaminants in the environment at TAN and other INEL sites. The NPL identifies sites of high priority for investigation and remediation of hazardous materials.

Since INEL is a federal facility, CERCLA requires the Department of Energy, as the managing agency, to enter into an agreement with EPA to coordinate the remedial effort. In order to avoid potential conflict between CERCLA and RCRA and overlapping jurisdiction by different agencies, a Federal Facility Agreement/Consent Order (FFA/CO) between DOE-ID, EPA Region X, and the State of Idaho was negotiated and became effective December 9, 1991.

This FFA/CO superseded the COCA and outlined the remedial action process that encompasses all investigations of hazardous substances and remedial activities at TAN and the other INEL sites. The FFA/CO will integrate CERCLA response obligations with RCRA and the State of Idaho Hazardous Waste Management Act (HWMA) corrective action obligations. All investigation and remedial activities will be conducted in accordance with CERCLA regulations

implemented under the National Contingency Plan (NCP). The NCP amends existing provisions and adds new major authorities to CERCLA.

3.2.1 Response Actions

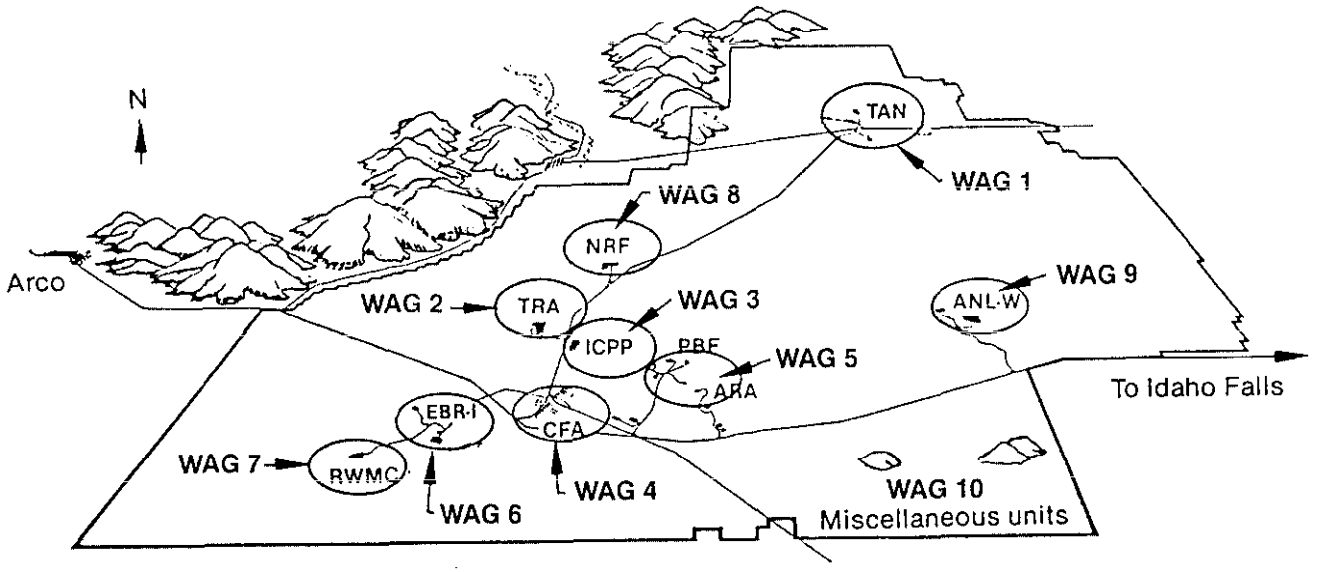
CERCLA Section 104 provides broad authority for a federal program to respond to releases of hazardous substances, pollutants, or contaminants. There are two major types of response actions: removal action and remedial action. A removal action is generally short-term in nature and relates to emergency situations that should not wait for investigations that are lengthy in scope. In comparing the two actions, note that a removal action solves an immediate threat, and a remedial action is taken to mitigate a long-term threat. The ultimate objective of the groundwater RI/FS is to select a remedial action for contaminated aquifer at TAN.

3.2.2 Waste Area Groups

INEL is a large installation with a number of operating facilities, each containing a number of potentially hazardous locations. For management purposes, INEL has been divided into ten smaller parts called "waste area groups" (WAGs). WAGs 1 through 9 correspond to operating facilities at INEL, while WAG 10 corresponds to site-wide concerns, including the Snake River Plain Aquifer. WAG 10 also addresses miscellaneous surface and subsurface areas not included in the other nine WAGs. WAG 1 includes all the facilities at TAN. The map shown in Figure 3-1 illustrates where TAN is located within the boundaries of INEL.

3.2.3 Operable Units

WAG 1 has been broken down into ten working "operable units" (of which Operable Unit 1-07B is the RI/FS) to focus investigation and remedial efforts. All potentially hazardous areas identified under the COCA were assigned to an operable unit. Each operable unit may contain one or more potentially hazardous areas. Further descriptions of the WAGs and operable units will be included in the Action Plan of the FFA/CO.



1. Test Area North
2. Test Reactor Area
3. Idaho Chemical Processing Plant
4. Central Facilities Area
5. Power Burst Facility/Auxiliary Reactor Area
6. Experimental Breeder Reactor
7. Radioactive Waste Management Complex
8. Naval Reactor Facility
9. Argonne National Laboratory-West
10. Miscellaneous units including the Snake River Plain Aquifer

Figure 3-1. Waste area groups (WAGs) at the INEL.

3.3 National Environmental Policy Act (NEPA)

As stated previously, all TAN investigation and remedial activities will be conducted in accordance with the DOE-ID policy of integrating NEPA requirements with CERCLA regulations. The result will be a series of documents for each remedial action that satisfies both Acts. Such a practice is permitted and advocated by 40 CFR 1506.4, which states that "Any environmental document in compliance with NEPA may be combined with any other agency document to reduce documentation and paperwork."

Under NEPA, a more formal approach is required to inform the public earlier in the process. Where appropriate, DOE-ID will coordinate public involvement activities prescribed by NEPA, with the public participation requirements of CERCLA. In order to inform the public on how compliance with NEPA and CERCLA requirements will be achieved, this Community Relations Plan supplement was prepared.

4. COMMUNITY BACKGROUND

The DOE, the EPA, and the IDHW took a state-wide approach in implementing the overall Community Relations Plan because activities at INEL affect citizens either environmentally or economically throughout the state. Specific reasons for this approach are the following:

- The Snake River Plain Aquifer and the Snake River are primary sources of water for domestic, agricultural, and industrial purposes. Waste disposal practices at INEL have impacted water quality in the Snake River Plain Aquifer.
- INEL is one of the state's largest employers. While INEL primarily affects the economy of communities in Southeast Idaho, the economic effects are felt statewide.
- State-wide interest in INEL has increased during the past few years because of increased sensitivity of the public to environmental issues and public debate over possible new weapons-related defense initiatives at INEL.
- Idaho's Congressional delegation, the governor, other state officials, and members of the State Legislature are interested in programs and environmental actions at INEL.

For these reasons, DOE-ID, EPA, and IDHW believe that the affected community includes concerned citizens throughout the state, local and state officials, environmental and civic groups, educators, businesses, and employees at the INEL. More detailed information on community background can be found in the installation-wide Community Relations Plan.

5. COMMUNITY RELATIONS ACTIVITIES

5.1 CERCLA Requirements For Community Relations

This Community Relations Plan, required under CERCLA, was developed pursuant to the INEL-wide CRP prepared by DOE-ID. This Plan describes public involvement requirements and public participation activities that will occur during the implementation of the TAN Groundwater RI/FS. Figure 5-1 shows how community relations activities will be integrated with the work being performed. This figure is supplemented by Table 5-1, which is a list of the key community relations milestones for the TAN Groundwater RI/FS.

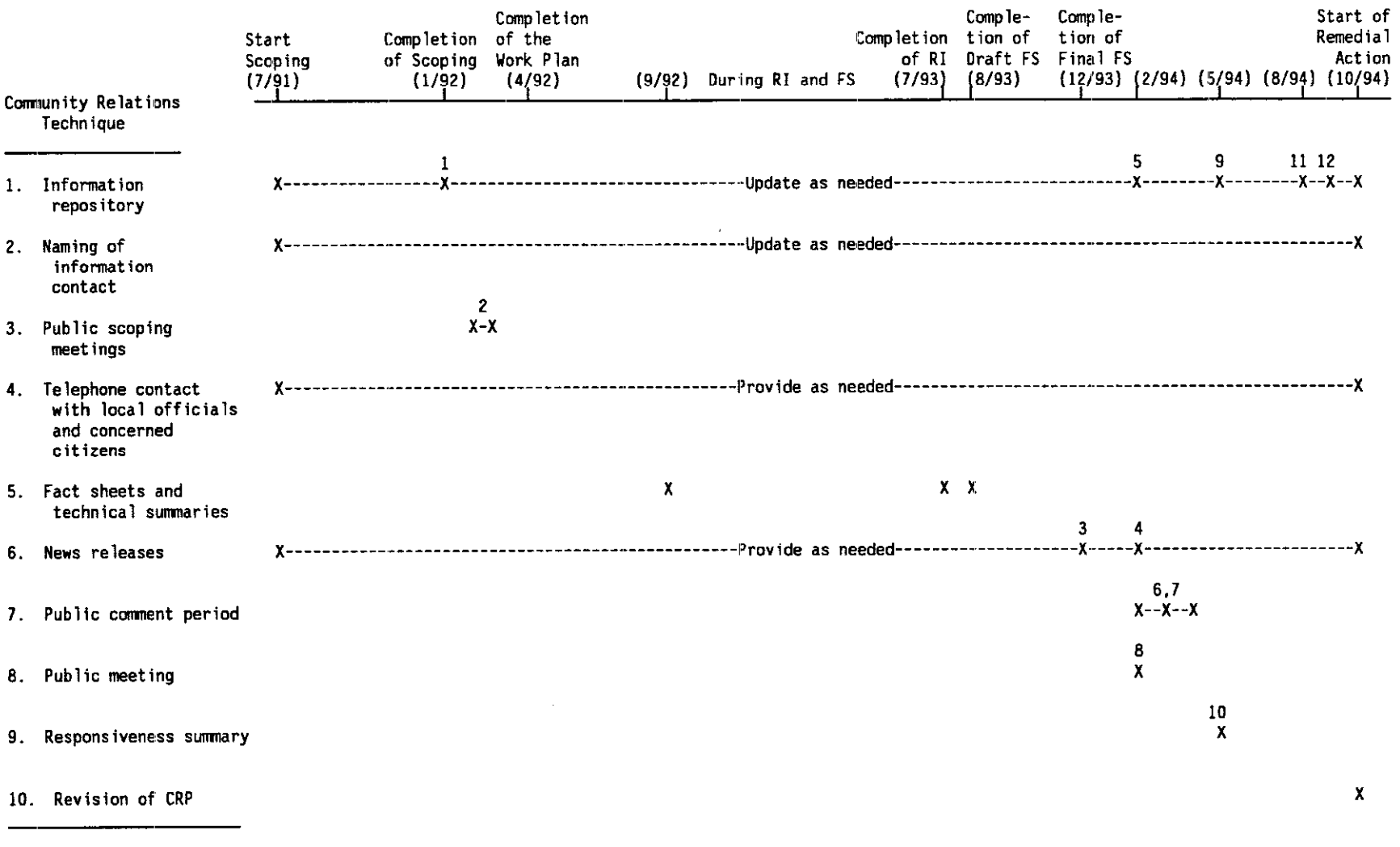
Community relations activities outlined in this plan are intended to meet the following needs:

- Understanding the complexity of environmental restoration issues
- Identifying problems and issues that should be addressed
- Identifying alternative solutions to those problems and issues
- Addressing conflicts and misconceptions
- Pursuing actions and decisions in the best overall interest of the public and environment.

Interested citizens will be encouraged to look over Figure 5-1 and Table 5-1 to find opportunities for involvement such as reading reports, brochures, and fact sheets; attending an informal briefing; visiting the nearest Information Repository; or sending in written comments or questions.

The following paragraphs add detail to some of the public involvement activities highlighted in Figure 5-1 and Table 5-1.

1. Information repositories. Information repositories have been established in the public libraries of each of the following Idaho cities: Idaho Falls, Pocatello, Twin Falls, Boise, and Moscow. Appendix B lists the address, days, and hours each repository is open. Additional information repositories may be established if sufficient community interest is expressed.



Notes:
Numbers 1 through 12 shown above correspond to the key milestones given in Table 5-1.
The "X" marks indicate the start and end of a process or the proposed date when a milestone will be met.

Figure 5-1. Timing of community relations activities for the TAN Groundwater RI/FS.

Table 5-1. Community relations activities for the TAN Groundwater RI/FS.

	Activity	Schedule
1.	Place scope of work in Administrative Record	February 15, 1992
2.	NEPA/CERCLA scoping meetings	February 3-5, 1992
3.	Prepare press release on RI/FS and Proposed Plan	December 30, 1993
4.	Publish public notice of RI/FS and Proposed Plan	February 5-15, 1994
5.	Place RI/FS and Proposed Plan in Administrative Record	February 10, 1994
6.	Public comment period on RI/FS and Proposed Plan	February 10, 1994 - March 13, 1994
7.	Conduct public TAN site tour after start of public review period	February 20, 1994
8.	Conduct public meeting on RI/FS and Proposed Plan	February 23-28, 1994
9.	Place transcripts of public meeting on the Proposed Plan in information repositories	May 15, 1994
10.	Send copy of responsiveness summary to commenters and mailing list contacts	May 20, 1994
11.	Publish notice of public availability of Record of Decision	August 22-28, 1994
12.	Place Record of Decision and responsiveness summary in information repositories and in Administrative Record	September 30, 1994

The following types of documents for the TAN RI/FS (and other INEL activities) will be put into the information repositories as the documents are completed:

- Consent Order and Compliance Agreement
- Federal Facility Agreement/Consent Order and Action Plan
- Index to the Administrative Record
- TAN RI/FS & DOE-ID Community Relations Plans
- TAN RI/FS Work Plan
- Remedial Investigation Report with Baseline Risk Assessments
- RI Report
- RI/FS Report
- Record of Decision
- Responsiveness Summaries
- Brochures
- Press Releases
- Fact Sheets
- Newsletters
- Reports and documents related to environmental investigations
- DOE Environmental Restoration and Waste Management Five-Year Plan
- INEL Environmental Restoration and Waste Management Site-Specific Plan

2. Administrative Record. An Administrative Record containing all information used in the decision-making process for remedial activities will be available for review and copying at the Woodruff Avenue Complex, 200 South Woodruff Avenue, Idaho Falls. For convenient public access in the future, a branch of the Administrative Record will be established at the INEL Technical Library at 1776 Science Center Drive in Idaho Falls. Written and oral comments received during public comment periods will become a part of the Administrative Record. An index to the Administrative Record will be placed in Information Repositories and updated regularly.

3. Public Comment Periods. A Public comment period will be held for the Proposed Plan prior to the Record of Decision (See Table 5-1). The Plan will describe remedial alternatives and the preferred alternative for the TAN Groundwater project. When the Plan has been completed, a two-week period of public notice will be announced regarding its availability. At a minimum, this notice will consist of display advertisements in local newspapers describing procedures for submitting comments. Following that, a 30-day comment period will be provided. Comments can be provided in writing or given verbally. The comment period may be extended another 30 days if requested in writing.

   Public meetings will be held during the comment period regarding final selection of a remedial alternative. The number and location of these meetings for comments will be determined before the scheduled start date of the public comment period. Public notification will be provided through news releases and direct mailing of the meeting schedule. Verbal comments received during those meetings and written comments received during the comment period will be given equal consideration by DOE-ID, EPA, and IDHW in selecting a remedial alternative. Transcripts will be prepared from the meetings and made a part of the Administrative Record and information repositories.

4. Responsiveness Summary. Following a public comment period, comments will be compiled, and a response to each comment will be documented in a Responsiveness Summary, which will be part of the ROD. Comments received during the public comment period will be considered in the remedial action decision for the TAN Groundwater RI/FS.

5. Record of Decision. Following the Responsiveness Summary and explanation of significant changes to the plan (if any), a ROD specifying the selected remedial alternative will be prepared by DOE. The ROD will be issued following EPA or State of Idaho approval, and will include the summary. If the selected remedy is different from alternatives listed in the RI/FS report and the Proposed Plan, the differences will be explained in the ROD.

   An additional public comment period will be provided if the selected remedial alternative is significantly different from alternatives in the RI/FS Report and Proposed Plan.

5.2 Requests For Additional Activities

This part of the supplemental Community Relations Plan describes the extra public involvement activities in Figure 5-1 and Table 5-1 in greater detail.

1. Briefings, Presentations, or Discussions. Semiannual briefings, presentations, or discussions will be conducted with interested individuals, groups, organizations, and agencies. More frequent briefings or presentations will be provided as remedial efforts at TAN intensify. The DOE-ID Environmental Restoration Division and INEL Public Affairs offices will invite and seek group discussions, briefings, meetings, and presentations regarding remediation issues.

2. Tours. Interested individuals and groups will be provided tours of facilities at TAN. For example, some tours may be conducted to visit areas associated with environmental restoration; waste technology demonstration; and waste treatment, storage, and disposal.

3. Public Involvement Meetings. Semiannually, or as requested, public involvement meetings will be held in interested communities. Where possible, meetings will be held to inform the public about the RI/FS process, or to give an update on the status of the RI/FS.

4. Newsletter. The INEL Environmental Restoration Program will publish the INEL Reporter on a quarterly basis. Its purpose is to inform the public about environmental investigation and remedial activities. The newsletter will be distributed via the mailing list described below.

5. Brochures. Nontechnical brochures will be prepared and distributed via the mailing list and through other means to give the public a better understanding of the Snake River Plain Aquifer, facts about radiation, waste management, environmental monitoring, waste units being remediated, and technology used to complete the work.

6. Fact Sheets. Fact sheets will be prepared and distributed via the mailing list to provide summaries of environmental investigations and related technical reports or background information helpful in understanding technical documents.

7. Press Releases. Press releases will be prepared and distributed to the news media announcing public meetings and public comment periods, and to publicize the latest developments of the RI/FS.

8. Mailing List. A mailing list will be developed to distribute information to the public and the news media. That list will be developed by adding the names of those interviewed, others expressing an interest in INEL, public officials, and names gathered during the development of other Community Relations Plan activities.

Persons interested in being added to the mailing list can contact DOE-ID/INEL personnel listed in Appendix A.

9. News Media. DOE-ID will keep the news media informed of remedial activities by providing brochures, press releases, newsletters, fact sheets, and final reports. In addition, officials will meet with news media representatives to provide them with accurate information. Reporters will be invited and encouraged to visit TAN.

10. Displays and Exhibits. The INEL Environmental Restoration Program will utilize public gatherings, meetings, open houses, and other opportunities to set up displays and exhibits covering topics requested by members of the general public. Officials from INEL will be on hand to answer questions and listen to public concerns.

11. Employee Communications. The community relations activities described in this plan are available to employees at INEL as well as the general public. In addition, employees will be kept informed via the *INEL Reporter*, various company newsletters, computer mail systems, and presentations by management.

These activities will be conducted routinely throughout the course of RI/FS activities at TAN. Additional activities may be added to the list if requested by the community. All comments received from the public concerning ways to improve communication and public participation will be considered when updating this plan.

APPENDIX A

LIST OF CONTACTS

APPENDIX A

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DOE-ID Environmental Restoration Program

Jerry L. Lyle (208) 526-1148
Acting Deputy Assistant Manager
Environmental Restoration
and Waste Management
DOE Idaho Field Office
785 DOE Place
Idaho Falls, ID 83402

Alice C. Williams (208) 526-0972
Director
Environmental Restoration Division
DOE Idaho Field Office
785 DOE Place
Idaho Falls, ID 83402

INEL Community Relations Plan

Reuel Smith (208) 526-6864
CRP Coordinator
INEL Environmental Restoration Program
785 DOE Place
Idaho Falls, ID 83402

INEL Public Affairs

Kathy Whittaker (208) 526-9586
Chief of Public Affairs and Tribal Liaison
INEL Public Affairs
785 DOE Place
Idaho Falls, ID 83402

Nick Nichols (208) 526-1693
Media Contact
INEL Public Affairs
785 DOE Place
Idaho Falls, ID 83402

U.S. Environmental Protection Agency

Wayne Pierre (206) 553-7261
Federal Facility Superfund Branch
EPA Region 10, HW-074
1200 Sixth Avenue
Seattle, WA 98101

Bub Loiselle (206) 553-1283
Community Relations Coordinator
EPA Region 10, HW-117
Park Place Building
1200 Sixth Avenue
Seattle, WA 98101

Fran Allans (208) 334-1450
EPA Region 10
Idaho Operations Office
422 West Washington Street
Boise, ID 83702

State of Idaho INEL Oversight Program[a]

Steve R. Hill, Manager (208) 334-6549
INEL Oversight Program
Idaho Department of Health and Welfare
1410 N. Hilton
Boise, ID 83706

Sheila Ison (208) 334-5761
Public Information Officer
INEL Oversight Program
Idaho Department of Health and Welfare
1410 N. Hilton
Boise, ID 83706

John Ledger, Acting Chief (208) 334-5879
Hazardous Materials Bureau
Idaho Department of Health and Welfare
450 West State Street
Boise, ID 83720

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a. Toll-free calls can be made by calling 1-800-232-INEL.

APPENDIX B

INEL INFORMATION REPOSITORIES

APPENDIX B

INEL INFORMATION REPOSITORIES

Location, Days, and Hours Open:

INEL Technical Library, 1776 Science Center Drive,
Idaho Falls, ID 83415; (208) 526-1185

Hours: 8:00 a.m. - 7:00 p.m. Monday - Thursday
8:00 a.m. - 5:00 p.m. Friday
9:00 a.m. - 1:00 p.m. Saturday

Idaho Falls Public Library, 457 Broadway,
Idaho Falls, ID 83402; (208) 529-1450

Hours: 9:00 a.m. - 9:00 p.m. Monday - Thursday
9:00 a.m. - 5:30 p.m. Friday, Saturday

Twin Falls Public Library, 42nd Street East,
Twin Falls, ID 83301; (208) 733-2964

Hours: 10:00 a.m. - 6:00 p.m. Monday, Friday
10:00 a.m. - 9:00 p.m. Tuesday, Wednesday, Thursday
12:00 p.m. - 5:00 p.m. Saturday

Pocatello Public Library, 812 East Clark,
Pocatello, ID 83201; (208) 232-1263

Hours: 10:00 a.m. - 9:00 p.m. Monday-Thursday
10:00 a.m. - 6:00 p.m. Friday, Saturday

Boise Public Library, 715 South Capitol Blvd.,
Boise, ID 83706; (208) 384-4076

Hours: 10:00 a.m. - 6:00 p.m. Monday, Friday
10:00 a.m. - 9:00 p.m. Tuesday, Wednesday, Thursday
1:00 p.m. - 5:00 p.m. Saturday, Sunday

Moscow-Latah County Library, 110 South Jefferson,
Moscow, ID 83843; (208) 882-3925

Hours: 10:00 a.m. - 9:00 p.m. Monday, Thursday
10:00 a.m. - 6:00 p.m. Tuesday, Wednesday, Friday
10:00 a.m. - 5:00 p.m. Saturday

APPENDIX C

GLOSSARY

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GLOSSARY

Argonne National Laboratory-West (ANL-W) - INEL facility for testing breeder reactor technology. ANL-W houses Experimental Breeder Reactor II, the first pool-type liquid-metal reactor. The facility has four other reactors and two fuel examination facilities.

Central Facilities Area (CFA) - INEL facility serving as headquarters for environmental laboratories, security, fire protection, medical, communications systems, warehouses, cafeteria, vehicle and equipment pools, bus system, and laundry.

Comprehensive Environmental Response. Compensation and Liability Act (CERCLA)- Also known as Superfund, the federal statute enacted in 1980 and reauthorized in 1986 that provides the statutory authority for cleanup of hazardous substances that could endanger public health or welfare or the environment.

Community Relations Plan (CRP) - A report that assesses and defines a community's informational needs concerning potential hazards posed by conditions at hazardous waste sites. The CRP also encourages and ensures two-way communications between an affected community and the public agency overseeing cleanup.

Experimental Breeder Reactor I (EBR-I) - The first nuclear reactor in the world to generate usable amounts of electricity. Today, EBR-I is a National Historic Landmark, open to the general public.

Feasibility Study (FS) - The step in the CERCLA process in which alternatives for a remedial action system are investigated and screened.

Idaho Chemical Processing Plant (ICPP) - INEL complex housing reprocessing facilities for government-owned defense and research spent fuels. ICPP facilities include spent fuel storage and reprocessing areas, a waste solidification facility and related waste storage bins, remote analytical laboratories, and a coal-fired steam generating facility.

Interim Action (IA) - Any discrete action implemented, prior to a full remedial action, to prevent or minimize the releases of hazardous substances to the environment.

National Priorities List (NPL) - The EPA's list of the top priority hazardous waste sites eligible for investigation and cleanup under the federal Superfund program.

Naval Reactor Facility (NRF) - INEL facility housing prototype reactors for U.S. Navy surface ships and submarines. The facility also serves as a training school for officers and crew who operate reactors for the Navy.

Power Burst Facility (PBF) - INEL facility for testing nuclear reactor fuels. Currently on standby status, PBF is being considered for use in brain cancer treatments for a program called Boron Neutron Capture Therapy.

Preliminary Assessment/Site Inspection (PA/SI) - The CERCLA initial process for collecting and reviewing information about a known or suspected hazardous waste site or release to determine if a site needs further study or if a response action is required.

Proposed Plan - A summary of the Agency's preferred cleanup strategy, the rationale for the preference, a review of the alternatives presented in the detailed analysis of the RI/FS, and a presentation of any waivers to cleanup standards, if any are proposed.

Radioactive Waste Management Complex (RWMC) - INEL facility established in 1952 as a controlled area for disposal of solid radioactive wastes generated in INEL operations. Since 1954, the facility has received defense waste for storage.

Record of Decision (ROD) - The CERCLA report documenting the selection of remedial action to be implemented at a site after the RI/FS and Proposed Plan have been completed. The ROD is published in the Federal Register.

Remedial Action (RA) - The CERCLA process of remedial action implementation after the investigative steps have been completed, after issuing the Record of Decision, and after the Remedial Design has been completed.

Remedial Decision (RD) - The CERCLA process of design for the remedial action alternative that was selected in the Record of Decision.

Remedial Investigation (RI) - The CERCLA process that determines the extent of hazardous substance contamination and includes, as appropriate, treatability investigations. The RI is done in conjunction with the feasibility study.

Removal Action - An immediate action taken over the short-term to address a release or threatened release of hazardous substances.

Resources Conservation and Recovery Act (RCRA) - A federal law enacted in 1976 (and amended in 1980 and 1984) that regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes. In this Federal Facilities Agreement, RCRA is defined as being "functionally equivalent" to CERCLA.

Responsiveness Summary - A summary of oral and/or written public comments received during a comment period on key documents and DOE-ID responses to those comments. The Responsiveness Summary is especially valuable during the decision process at a site because it highlights community concerns about the proposed decisions.

Superfund - The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also referred to as the Trust Fund.

Superfund Amendments and Reauthorization Act (SARA) - The reauthorization of the CERCLA statute enacted by Congress in October 1986.

Test Area North (TAN) - INEL facility located at the northern end of the Site, consisting of facilities for handling, storage, examination, and research and development of spent nuclear fuel.

Test Reactor Area (TRA) - INEL complex housing facilities for studying the effects of radiation on materials, fuels, and equipment.

Transuranic Contaminated Waste - Waste contaminated with long-lived transuranic elements in concentrations within a specified range established by DOE, EPA, and the Nuclear Regulatory Commission. Those are elements shown above uranium on the chemistry periodic table, such as plutonium, americium, and neptunium.

Volatile Organic Compound - Carbon-based chemicals that evaporate readily into the air (e.g., carbon tetrachloride, benzene, toluene, and xylene--all of which are in gasoline).

REMEDIAL INVESTIGATION/FEASIBILITY STUDY PRELIMINARY IDENTIFICATION OF COMBINED FEDERAL AND STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) FOR THE TEST AREA NORTH GROUNDWATER OPERABLE UNIT AT THE IDAHO NATIONAL ENGINEERING LABORATORY

May 1992

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ACRONYMS

ARARs	applicable or relevant and appropriate requirements
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
DOE	Department of Energy
EPHA	Environmental Protection and Health Act
EPA	Environmental Protection Agency
FR	Federal Register
FWQC	Federal Water Quality Criteria
IDHW	State of Idaho Department of Health and Welfare
INEL	Idaho National Engineering Laboratory
NCP	National Contingency Plan
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation/feasibility study
TAN	Test Area North

REMEDIAL INVESTIGATION/FEASIBILITY STUDY PRELIMINARY IDENTIFICATION OF COMBINED FEDERAL AND STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) FOR THE TEST AREA NORTH GROUNDWATER OPERABLE UNIT AT THE IDAHO NATIONAL ENGINEERING LABORATORY

(DRAFT)

1. INTRODUCTION

The Idaho National Engineering Laboratory (INEL) was proposed for listing on the National Priorities List (NPL) of the National Contingency Plan (NCP) on July 14, 1989 [54 Federal Register (FR) 29820]. This listing was proposed by the U.S. Environmental Protection Agency (EPA) under the authorities granted EPA by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986. The final rule listing the INEL on the NPL was published on November 21, 1989 at 54 FR 44184.

The groundwater at Test Area North (TAN) will be remediated through the remedial investigation/feasibility study (RI/FS) process outlined in the NCP. CERCLA requires that onsite remedial actions comply with requirements or standards under federal and state environmental laws (EPA, 1988). The requirements that are applicable or relevant and appropriate to the remedial actions at the specific site need to be met. The "applicable" requirements are defined by the EPA as

> Cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

The EPA defines "relevant and appropriate" requirements as

> Cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not 'applicable' to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

In addition, nonpromulgated advisories or guidance issued by federal or state governments that are not legally binding and do not have the status of applicable or relevant and appropriate requirements (ARARs) are "to be considered." In many circumstances, these advisories will be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup (EPA, 1988).

Three types of federal and state ARARs will be identified for the TAN groundwater system: chemical-specific, location-specific, and action-specific (EPA, 1988). Chemical-specific ARARs are usually health- or risk-based numerical standards that establish the acceptable chemical concentrations that may be found in, or released to, the environment. Location-specific ARARs restrict chemical concentrations or activities because of the geographical or physical setting of the site. Action-specific ARARs are usually technology- or activity-based requirements or restrictions on actions taken at the site. Generally, action-specific ARARs will not guide development of remedial action alternatives, but they will indicate how to implement the selected remedy.

The ARARs that may apply to the TAN Groundwater RI/FS and its remedial action should be identified and considered at several points in the remedy selection process. Because ARARs are site-specific, they must be refined as additional information is obtained about the site (EPA, 1988). The EPA (1988) identifies the following four phases of the RI/FS process during which ARARs should be identified: scoping, site characterization, development of remedial alternatives, and detailed design.

This document identifies potential ARARs, including both federal and State-of-Idaho requirements, based on available site data and on the five potential remedial alternatives (no action, pump and treat, institutional controls, in-situ air bubbling, and in-situ biodegradation) that have been identified so far. These ARARs will be refined throughout the RI/FS process at TAN. The potential federal ARARs were determined from the Code of Federal Regulations (EPA, 1990) and various federal acts. The potential state ARARs were provided in a letter from Mr. Dean Nygard, State of Idaho Department of Health and Welfare (IDHW), to Mr. Jerry Lyle, U.S. Department of Energy, Idaho Field Office (DOE-ID), dated April 29, 1991. To-be-considered material is also presented herein.

2. SITE DESCRIPTION

TAN is located in the northeastern portion of the INEL (Figure 2-1). TAN was built between 1954 and 1961 to support the Aircraft Nuclear Propulsion Program sponsored by the United States Air Force and the Atomic Energy Commission. This section provides a brief overview of waste disposal practices relating to the groundwater system at TAN. The reader is referred to Section 2 of the RI/FS Work Plan (EG&G Idaho, 1992) for a detailed description of the environmental setting at TAN, and general waste disposal practices throughout the history of operations at the site.

In 1953, an injection well was drilled to a depth of 305 ft below land surface (bls) to dispose of liquid effluents. The injection well was last used on a regular basis in 1972, and the drain lines to the well were plugged with cement in 1984. From 1955 to 1972, organic, inorganic, and radioactive waste waters were added to nonhazardous process waters and sanitary waste waters, and then injected into the well and the groundwater about 200 ft bls. The well was also used from the late 1950s to the early 1960s to dispose of concentrated evaporator sludges from the processing of low-level radioactive wastewaters. The organic, inorganic, and radionuclide contamination has moved with the groundwater to the southeast. Contaminants have been found primarily within 1/4 mi of the injection well. However, some contaminants may have migrated as far as 1-1/2 mi since 1955. A list of contaminants of concern is provided in Section 3.

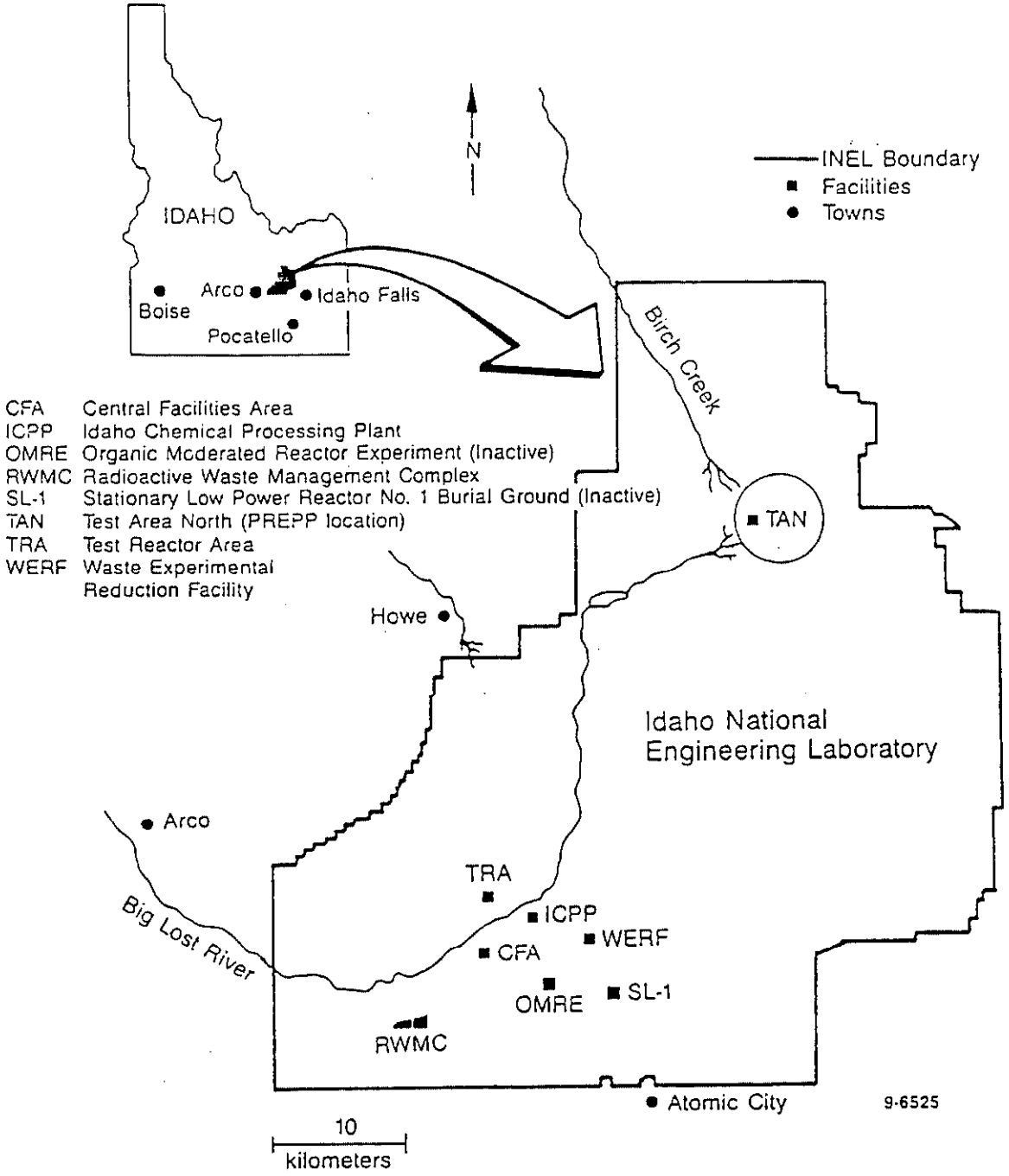

Figure 2-1. Location of Test Area North at the Idaho National Engineering Laboratory.

3. CHEMICAL-SPECIFIC ARARs

The federal chemical- and radionuclide-specific ARARs that have been identified for the TAN groundwater system are generally derived from five federal acts, including the Safe Drinking Water Act, the Clean Water Act, the Resource Conservation and Recovery Act (RCRA), the Atomic Energy Act, and the Clean Air Act. The State chemical- and radionuclide-specific ARARs that have been identified were primarily derived from General Water Use Designation (IDAPA §16.01.2101) and Specific Water Quality Criteria for Use Classifications (IDAPA §16.01.2250). A list of contaminants of concern in the TAN groundwater system, and their associated chemical-specific water and air quality standards are identified in Tables 3-1, 3-2, and 3-3, respectively. The seven contaminants of concern given in Table 3-1 came from a comparison of risk-based concentration values against actual groundwater concentrations of the contaminants identified from 1989 and 1990 groundwater sampling at TAN. Table 3-4 identifies the preliminary federal chemical-specific ARARs that have been reviewed, and their applicability or relevance to the TAN groundwater system.

Table 3-1. List of contaminants of concern in the TAN groundwater system[a]

Organics and Inorganics	Radionuclides[b]
1,1-dichloroethylene	Strontium-90
Tetrachloroethylene	Tritium (hydrogen-3)
Trichloroethylene	
Lead	
Mercury	

a. The data that support this list of contaminants are contained in the appendices of the RI/FS Work Plan. The contaminants were identified from validated data from 1989 and 1990 groundwater sampling and include only those contaminants that were found in both years. Contaminants found in only one year at low levels (<15 ppb) or in the unvalidated 1990 sludge data were not included in this list because they were not considered to be significant problems. These contaminants included methylene chloride, chloroform, toluene, 2-Butanone, 1,2-dichloroethane, and carbon tetrachloride. Vinyl chloride was detected at levels up to 40 ppb in samples from the injection well in 1988, but it has not been found in any other groundwater samples. Thirteen other contaminants did not exceed their risk-based concentration levels and were dropped froma preliminary list of contaminants. These contaminants are acetone, 1,2-dichloroethylene, 1,1,1-trichloroethane, aluminum, barium, chlorides, chromium, copper, iron, manganese, nickel, sulfates, and zinc.

b. These contaminants have been found in the groundwater and/or the sludge. Three other radionuclides found in the sludge were not included in this list because they were not found in the groundwater (americium-241, europium-154, and plutonium-239). Two radionuclides, cesium-137 and cobalt-60, were found in the groundwater, but at very low levels and were found to be in the safe-risk range.

Table 3-2. Chemical-specific water quality ARARs for the contaminants of concern in the TAN groundwater system

Chemical Compound/Radionuclide	Federal Drinking Water Standard (µg/L)			Idaho State Water Quality Standards[a]	
	Primary MCLs[b]	MCLGs[c]	Secondary MCLs[d]	Idaho Drinking Water Standards (µg/L)	Secondary Maximum Contaminant Levels (µg/L)
Chemical Compound					
1,1-dichloroethylene	7	7	--	7	--
Tetrachloroethylene	5	0	--	--	--
Trichloroethylene	5	0	--	5	--
Lead	50(15[e])	5	--	50	--
Mercury	2	2	--	2	--
Radionuclides					
Strontium-90	8 pCi/L[f]	--	--	--	--
Tritium	20,000 pCi/L[f]	--	--	--	--

a. For undesignated groundwater use.

b. 40 Code of Federal Regulations (CFR) 141.11-141.16

c. 40 CFR 141.50-141.51

d. 40 CFR 143.3

e. Action level - effective December 1992.

f. These concentrations result in an annual dose equivalent of 4 mrem/yr. (40 CFR 141.16).

Table 3-3. Chemical-specific air quality ARARs for the contaminants of concern in the TAN groundwater system

	Federal Air Quality Standards		Idaho State Air Quality Standards[a]
	National Ambient Air Quality ($\mu g/m^3$)[b]	Standards for Hazardous Air Pollutants ($\mu g/m^3$)	Idaho Air Quality Regulations
Chemical Compounds			
1,1-dichloroethylene	--[c]	--	0.00013 lb/hr
Trichloroethylene	--[c]	--	0.00051 lb/hr
Tetrachloroethylene	--[c]	--	0.013 lb/hr
Lead	1.5	--	0.1 $\mu g/m^3$
Mercury	--	2,300 g/24 hr[d]	0.25 $\mu g/m^3$
Radionuclides			
Strontium-90	N/A	25 mrem/yr[e]	N/A
Tritium	N/A	25 mrem/yr[e]	N/A

a. Idaho Department of Health and Welfare, Rules and Regulations for the Control of Air Pollution in Idaho.

b. 40 CFR Part 50. Values are annual arithmetic means.

c. CFR Part 261.01(b). Substances whose ambient air emissions may cause serious health effects.

d. 40 CFR Part 61.

e. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides shall not produce an annual dose equivalent to the total body of any internal organ greater than 4 mrem/yr. If two or more radionuclides are present, the sum of their annual dose equivalent shall not exceed 4 mrem/yr.

Table 3-4. Preliminary federal chemical-specific ARARs for the TAN groundwater system

Statute	Regulation	Applicable	Relevant and Appropriate
Safe Drinking Water Act	40 CFR Part 141, National Primary Drinking Water Standards	--	•
	40 CFR Part 141, Maximum Contaminant Level Goals	--	•
Clean Air Act	40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants	•	--
Atomic Energy Act and Energy Reorganization Act	10 CFR Part 20, US Nuclear Regulatory Commission (NRC) Standards for Protection Against Radiation	--	•
Emergency Planning and Community Right-to-Know Act of 1986	40 CFR 355, Emergency Planning and Notification Under CERCLA	--	•

4. LOCATION-SPECIFIC ARARS

Location-specific ARARs are restrictions placed on hazardous substance concentrations or the conduct of activities because they occur in specific locations. Special location examples include the 100-year floodplain, archaeologically or historically significant areas, sensitive ecosystems, and seismic activity areas. Table 4-1 identifies the preliminary location-specific ARARs reviewed and their applicability or relevance to the TAN groundwater system.

Table 4-1. Preliminary location-specific ARARs for the TAN groundwater system

Statute	Regulation	Applicable	Relevant and Appropriate
Clean Air Act	40 CFR 52, "Prevention of Significant Deterioration"	•	--
Archeological Resources Protection Act	36 CFR 7, "Protection of Archeological Resources"	•	--
	36 CFR 296, "Protection of Archeological Resources; Uniform Regulations"	•	--
Preservation of American Antiquities Act	43 CFR 3, "Preservation of American Antiquities"	•	--

5. ACTION-SPECIFIC ARARs

Action-specific ARARs are usually technology- or activity-based requirements on action taken at a site. Action-specific ARARs generally do not guide remedial action alternative development, but they do indicate how the selected remedy must be implemented. The most significant federal requirements potentially applicable to cleanup activities at TAN stem from RCRA and the Clean Air Act. Action-specific ARARs are dependent upon the possible remedial options considered for the TAN groundwater system. Table 5-1 identifies potential action-specific ARARs that will be considered for TAN groundwater remediation. This list will be refined, and applicability will be determined as the remedy selection process proceeds.

Categorization of the potential action-specific ARARs in Table 5-1 has not been completed at this time (i.e., no dots are on the table) because possible remedial options must be developed during the RI/FS process. After the possible remedial options have been developed into alternatives for analysis, the action-specific ARARs in Table 5-1 will be categorized.

Table 5-1. Preliminary action-specific ARARs for the TAN groundwater system

Statute	Regulation	Applicable	Relevant and Appropriate
Resource Conservation and Recovery Act	40 CFR Part 260, "Hazardous Waste Management Systems"	--	--
	40 CFR Part 261, "Identifying Hazardous Waste"	--	--
	40 CFR Part 262, "Standards Applicable to Generators of Hazardous Waste"	--	--
	40 CFR Part 263, "Standards Applicable to Transporters of Hazardous Waste"	--	--
	40 CFR Part 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities"	--	--
	40 CFR Part 268, "Land Disposal Restrictions"	--	--
Hazardous Material Transportation Act	49 CFR Parts 171 through 179, "Standards for Transporters of Hazardous Waste"	--	--
Clean Air Act	40 CFR Part 50, "National Primary and Secondary Ambient Air Quality Standards"	--	--
	40 CFR Part 61, "National Emission Standards for Hazardous Air Pollutants"	--	--
	40 CFR Section 61.90, "National Emission Standards for Radionuclide Emission from DOE Facilities"	--	--
	40 CFR Part 200, "Standards for Performance for New Stationary Sources"	--	--
Atomic Energy Act	10 CFR Part 20, "Standards for Protection Against Radiation"	--	--
Migratory Bird Treaty Act	50 CFR Part 20, "Migratory Bird Protection"	--	--
Endangered Species Act	50 CFR Part 17, "Endangered and Threatened Wildlife and Plants"	--	--
	50 CFR Part 225, "Federal/State Cooperation in the Conservation of Endangered and Threatened Species"	--	--
	50 CFR Part 226, "Designated Critical Habitat"	--	--
	50 CFR Part 402, "Interagency Cooperation"	--	--

6. TO-BE-CONSIDERED MATERIAL

As discussed earlier, a category of to-be-considered material has also been developed to guide TAN groundwater system remedial action activities. This category identifies criteria, advisories, guidance, or policies that do not meet the definition of ARARs but may assist in determining what is protective or what may be useful in developing or carrying out remedial action alternatives. To-be-considered material for the TAN groundwater system includes:

- Applicable EPA guidance documents
- Applicable DOE orders
- Applicable executive orders
- New Clean Air Act amendments
- New Federal Pollution Minimization Laws for Contaminated Groundwater at Superfund Site (Draft, October 1986)
- Remedial action decisions at similar CERCLA sites
- Proposed standards under the Safe Drinking Water Act
- National Environmental Policy Act.

Specific DOE and executive orders that will be considered are listed in Table 6-1.

Table 6-1. DOE and executive orders to be considered

DOE Order Number	Title
5480.1B	Environment, Safety, and Health Program for DOE Operations
5480.3	Hazardous and Radioactive Mixed Hazardous Waste Management
5480.4	Environmental Protection, Safety, and Health Protection Standards
5820.2A	Radioactive Waste Management
5400.5	Radiation Protection of the Public and Environment
5480.11	Radiation Protection of Occupational Workers

Executive Order Number	Title
11988	Floodplain Management
11989	Off-Road Vehicles on Public Lands
11990	Protection of Wetlands
11991 and 11514	Protection and Enhancement of Environmental Quality
11543	Protection and Enhancement of the Cultural Environment
12088	Federal Compliance with Pollution Control Standards
12316	Response to Environmental Damage
12342	Environmental Safeguards on Activities for Animal Damage and Control on Federal Lands
12580	Superfund Implementation

7. STATE ARARs

The potential state ARARs are identified in Table 7-1. This list of potential state ARARs was taken from a letter from Mr. Dean Nygard, IDHW, to Mr. Jerry Lyle, DOE-ID, dated April 29, 1991. State ARARs are limited to any promulgated standard, requirement, criteria, or limitation under a state environmental or facility-siting law that is more stringent than any federal standard, requirement, criteria, or limitation, including each such state standard, requirement, criteria, or limitation contained in a program approved, authorized, or delegated by the Administrator.

Table 7-1. Preliminary state ARARs for the TAN groundwater system

Potential State ARARs	Citation	Applicable	Relevant and Appropriate
Environmental Protection and Health Act (EPHA)	Idaho Code §39-101 through 119	--	•
Hazardous Waste Transportation	Idaho Code §67-2929, 2930 (Supp. 1988)	--	•
Hazardous Materials/Hazardous Waste Transportation Enforcement Act	Idaho Code §49-2201 through 2212	--	•
Protection of Natural Resources	Idaho Code §67-5801 through 5804	--	•
Waste Disposal and Injection Wells	Idaho Code §42-3901 through 3919	--	•
Toxic Substances	IDAPA §16.01.1011, 01	--	•
Air Pollution Permits to Construct and Operating Permits	IDAPA §16.01.1012	--	•
Portable Equipment	IDAPA §16.01.1013	--	•
Fugitive Dust	IDAPA §16.01.1251 to 1253	--	•
Administrative Policy on Protection of Waters of the State	IDAPA §16.01.2050, 02	--	•
Water Use Classifications	IDAPA §16.01.2100	--	•
General Water Use Designations	IDAPA §16.01.2102	--	•
General Water Quality Criteria	IDAPA §16.01.2200	--	•
Restriction on Discharge and on Activities which Affect Water Quality	IDAPA §16.01.2300	--	•
Maintenance of Water Quality Standards	IDAPA §16.01.2302	--	•
Nonsewage Waste Water Discharges	IDAPA §16.01.2440	--	•
Subsurface Waste Disposal Facility	IDAPA §16.01.2460	--	•
Waste Water Injection Wells	IDAPA §16.01.2480	--	•
Hazardous Materials Spills	IDAPA §16.01.2850	--	•
Routing of Hazardous Waste Shipments	IDAPA §16.01.5500	--	•

8. ARAR WAIVERS

CERCLA §121 provides that, under certain circumstances, an ARAR may be waived (EPA, 1988). The circumstances under which a waiver might be invoked, and criteria for invoking the waivers are discussed below. In all cases, statutory requirements, such as remedies being protective of human health and the environment, cannot be waived (EPA, 1988):

1. Interim measures—A waiver for interim measures may be applicable if the interim remedial action will be followed, within a reasonable period of time, by complete remedial measures that will attain ARARs. The interim measures waiver may also apply to a final site remedy that is divided into several small actions.

2. Greater risk to health and the environment—This waiver may be invoked if a remedial action that meets an ARAR results in greater risks than an alternative option that does not meet that ARAR. Factors that may be considered in invoking this waiver are the magnitude of adverse impacts, duration of adverse impacts, and the reversibility of adverse impacts.

3. Technical impracticability—This waiver may be invoked if a remedy is not feasible or reliable from an engineering perspective. The engineering feasibility criterion for invoking this waiver would apply when current engineering methods for constructing and maintaining an ARAR-mandated remedy cannot be reasonably implemented. A waiver is appropriate when the reliability of a remedy is questionable, either because of technical controls or because of inordinate maintenance costs.

4. Equivalent standard of performance—This waiver may be used where an ARAR stipulates use of a design or operating standard, but equivalent or better remedial results could be achieved using an alternative design or method of operation.

5. Inconsistent application of state requirements—In the event of an inconsistent application of state requirements, an ARAR may be

waived to prevent unjustified or unreasonable restrictions from being imposed on the remedial actions. This waiver may be used if state requirements have been developed and promulgated but never applied because of lack of applicability in past situations, or if state standards have been variably applied or inconsistently enforced.

6. Fund balancing—When remedial action is undertaken solely under Superfund, certain ARARs may be waived to ensure fund-balancing among several Superfund sites, taking into consideration the relative seriousness posed by each site.

9. SUMMARY

Three types of potential federal and state ARARs were identified for remediation of the TAN groundwater system: chemical-specific, location-specific, and action-specific (EPA, 1988). The list of ARARs that may apply to the TAN Groundwater RI/FS and its remedial action will be considered and refined at several points in the remedy selection process. As more information is developed on the site, a more definitive list will be developed.

10. REFERENCES

EG&G Idaho, 1992, RI/FS Work Plan and Addenda for the Test Area North Groundwater Operable Unit at the Idaho National Engineering Laboratory, EGG-WM-9905.

EPA (Environmental Protection Agency), 1988, CERCLA Compliance with Other Laws Manual: Interim Final, EPA/540/G-89/006.

EPA, 1990, Code of Federal Regulations.

Letter from Mr. Dean Nygard, Idaho Department of Health and Welfare, to Mr. Jerry Lyle, Department of Energy, dated April 29, 1991.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PROPOSED PLAN FOR AN INTERIM ACTION TO REDUCE THE CONTAMINATION NEAR THE INJECTION WELL AND IN THE SURROUNDING GROUNDWATER AT THE TEST AREA NORTH IDAHO NATIONAL ENGINEERING LABORATORY

May 1992

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Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management
Under DOE Idaho Field Office
Contract DE-AC07-76ID01570

January 1992

Proposed Plan for an Interim Action to Reduce the Contamination Near the Injection Well and in the Surrounding Groundwater at the Test Area North, Idaho National Engineering Laboratory

OVERVIEW

This Proposed Plan describes alternatives for an interim action that is being considered to reduce the contamination near the injection well and in the surrounding groundwater at the Test Area North (TAN) at the Idaho National Engineering Laboratory (INEL; see Figure 1). The injection well is located at the Technical Support Facility in the central part of TAN which consists of facilities for storing, examining, and managing spent nuclear fuels.

This plan highlights the preferred interim remedial action proposed by the U.S. Department of Energy (DOE), with the agreement of the U.S. Environmental Protection Agency (EPA) and the Idaho Department of Health and Welfare (IDHW). The plan was developed and is issued in accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This plan also meets DOE requirements for evaluating the environmental impacts of all the alternatives.

The actual interim remedy selected for the contaminant reduction may be the preferred alternative, a modification of the alternative, a combination of elements from some or all of the alternatives, or another alternative identified as a better option based on public comment or other new information. Therefore, the public is encouraged to review and comment on all of the alternatives, not just the preferred alternative.

The preferred alternative presented in this plan represents the initial recommendation based on evaluations of site conditions and alternative remedial actions. DOE and EPA, in consultation with the IDHW, will select the actual interim remedial alternative. However, this action will not be selected until the public comment period has ended and all comments have been reviewed and considered.

Public Comment Period
January 13 to February 12, 1992

How you can participate - The public is encouraged to participate in the interim remedy selection process. You can participate in several ways. These include reading this Proposed Plan, reading additional documents at one of the information repositories listed on page 11, attending one of the three public meetings listed on page 13 and commenting on the Proposed Plan. Written and verbal comments will be given equal consideration and can be made at the public meetings or to Jerry Lyle at the address on page 11. All comments and transcripts of meetings will become part of the Administrative Record (see glossary). Information used to support the selection of the preferred alternative has been included in the Administrative Record, which is available to the public.

DOE, EPA, and IDHW will present their response to all comments submitted during the review period in a document called a Responsiveness Summary. Then, after considering these comments, DOE, EPA, and

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IDHW will choose the actual remedial action and document this choice in a Record of Decision. The Record of Decision and the Responsiveness Summary will be available in the Administrative Record at the information repositories listed on page 11. Questions on this process should be directed to the INEL Community Relations Office at the address listed on page 11.

Background

The INEL is an 890 square mile federal facility operated by DOE. The primary missions of the INEL are nuclear reactor technology development and waste management. In November 1989, the INEL was placed on the National Priorities List of hazardous waste sites because releases of hazardous substances that may pose a risk to human health and the environment have occurred.

Overall Site Background: To better manage the activities that may be needed to protect human health and the environment, the INEL has been divided into 10 Waste Area Groups. Each of these groups is in turn divided into operable units to allow investigation and remedial activities to occur more quickly. This strategy allows the DOE, EPA and IDHW to focus available remedial resources on those areas which could potentially pose the greatest risk to public health and the environment.

A framework for the investigation and remediation of each operable unit is in the Federal Facility Agreement and Consent Order (FFA/CO) and Action Plan documents for the INEL (also known as the Interagency Agreement). These documents, negotiated between the DOE, EPA and IDHW, describe procedures so that remedial actions at the INEL will be conducted according to specified schedules and in compliance with State and Federal environmental laws.

TAN Groundwater Interim Action and Remedial Investigation: The TAN groundwater contamination (designated as Operable Unit 1-07 under the FFA/CO) will be addressed under both an interim action and a Remedial Investigation/Feasibility Study (RI/FS). The interim action, as described in more detail in this plan, would begin to reduce contaminants near the injection well and in the surrounding groundwater. The interim

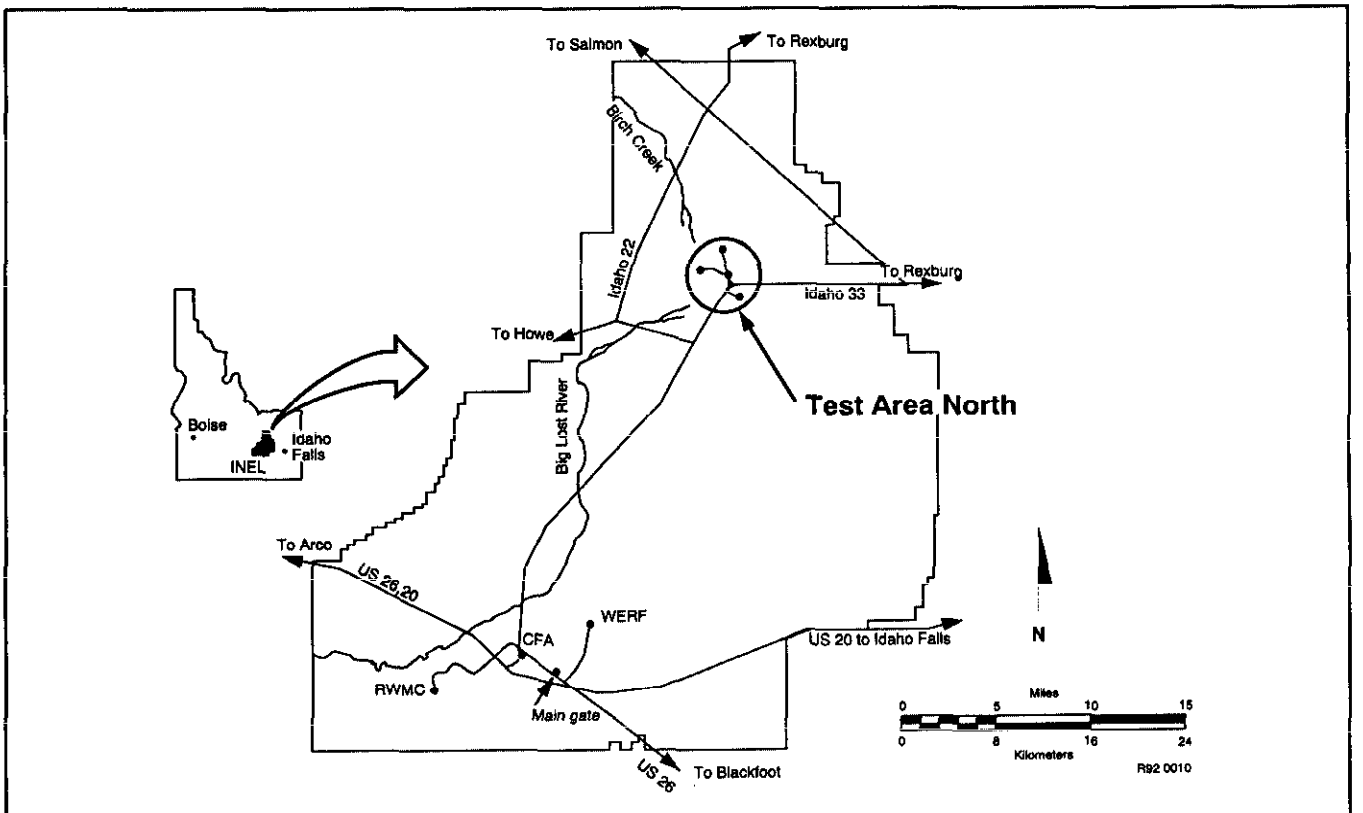

Figure 1. Test Area North (TAN) at the Idaho National Engineering Laboratory.

action would also provide actual field experience on groundwater remediation that could be used in the RI/FS to allow a more detailed evaluation of any final remedial action alternatives. Alternatives chosen for the final remedial action on the TAN groundwater would be identified in a separate RI/FS Proposed Plan that would be issued for public review before the final remedial action is selected in 1995.

Site Description

The principal source of groundwater contamination at TAN has been the Technical Support Facility injection well. As shown in Figure 2, the injection well is located in the southwestern corner of the Technical Support Facility at TAN. The well was drilled in 1953 to a depth of 310 feet and has a 12-inch diameter casing with openings from 180 to 244 feet and from 269 to 305 feet below the land surface.

The injection well was used until 1972 to dispose of TAN liquid wastes into the fractured basalt of the Snake River Plain Aquifer. After 1972, the wastes were discharged to the TAN disposal pond. These liquid wastes included organic, inorganic, and low-level radioactive wastewaters that were added to industrial and sanitary wastewaters. Activities that generated these wastes included efforts to develop a nuclear powered aircraft and tests that simulated accidents involving the loss of coolant from nuclear reactors.

Releases to the TAN groundwater were first identified in September 1987 when low levels of trichloroethylene and tetrachloroethylene were found in the two nearby wells that supply drinking water to TAN. Subsequent sampling in 1989 and 1990 at the drinking water and other TAN area wells confirmed the presence of trichloroethylene and tetrachloroethylene in the aquifer, and also identified lead and strontium as contaminants that exceeded drinking water standards. Concentrations of these four contaminants are shown in Table 1.

The original uses of the trichloroethylene and tetrachloroethylene (halogenated organics) cannot be clearly identified due to a lack of disposal and usage records. Therefore, these halogenated organics would likely not be considered listed solvents (F001 through F005) as described in 40 CFR Part 261 under the

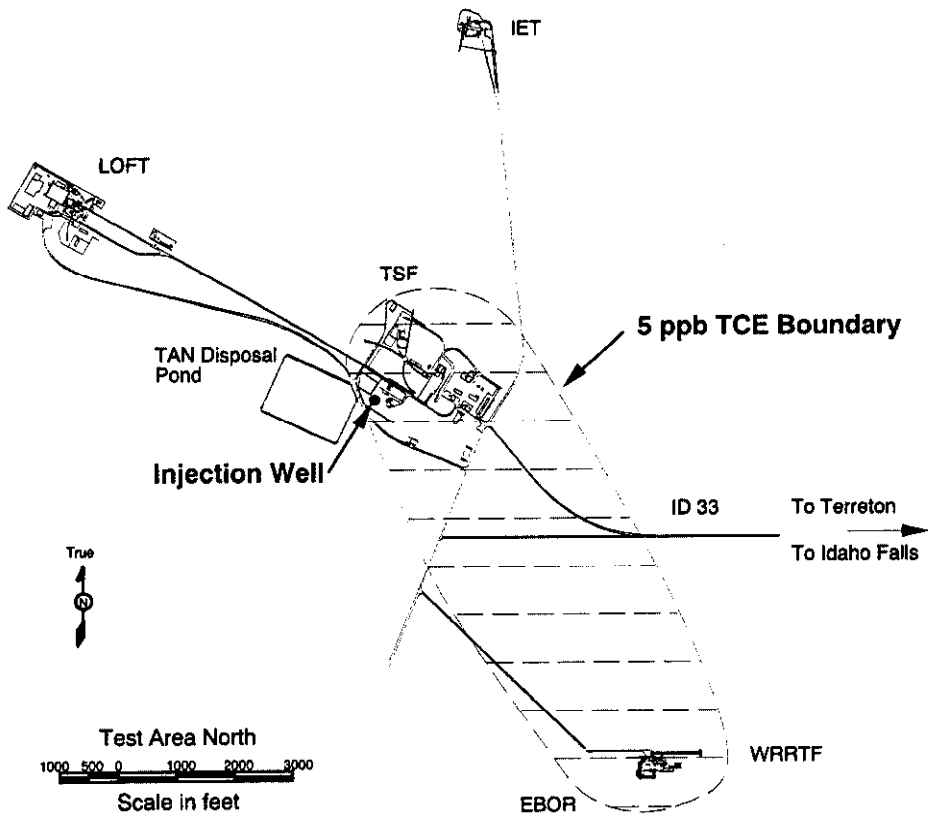

Figure 2. Estimated Contaminated plume boundaries.

Resource Conservation and Recovery Act (RCRA).

Some information about the present extent of contamination is known. The highest groundwater contamination levels are found near the injection well. These levels drop rapidly as the distance from the well increases. In the 30 years since the well started operation, the trichloroethylene may have travelled as far as 1-1/2 miles in the direction of groundwater flow (south to south-east; see Figure 2). The other contaminants of concern have not been found at significant levels more than 1/4 mile from the well. Based on existing knowledge, the trichloroethylene plume is not expected to reach existing supply or drinking water wells in areas outside of TAN for over 100 years.

The Snake River Plain Aquifer lies approximately 200 feet below land surface at the well. Contaminants have been found from this water surface to 400 feet below the ground surface.

Concentrations in the injection well itself have not been measured since 1990. However, trichloroethylene concentrations up to 28,000 micrograms per liter (µg/l) and tetrachloroethylene concentrations up to 37 micrograms per liter (µg/l) were measured in water that was removed from the well in early 1989.

In early 1990, an initial remedial effort removed sludge in the bottom 60 feet of the injection well. This sludge was determined to be a mixed waste (see glossary) and is being stored at the INEL until a facility is available to dispose of the waste.

Summary of Site Risks

The only wells that are currently contaminated are in the immediate TAN area, and the untreated groundwater is not accessible to TAN workers or the general public. Since 1989, the water from these contaminated wells has been treated to below drinking water standards, therefore the people using the water at TAN are not at risk.

Although there is very little direct human risk from the contaminated groundwater at TAN, trichloroethylene, tetrachloroethylene, lead, and strontium have been found at levels that exceed their drinking water standards. The trichloroethylene and tetrachloroethylene represent a greater potential threat due to their higher concentrations and they are the focus of this interim action.

Need and Purpose for the Interim Action

The purpose of this interim action is to reduce contamination in the groundwater near the injection well so that further degradation of the Snake River Plain Aquifer is prevented and the cost and complexity of a final remedy is reduced. This action is necessary because the groundwater beneath TAN contains contaminants at levels that may represent an unacceptable risk to future users.

Because the aquifer is made up of a complex system of sedimentary interbeds (see glossary) in between layered and fractured basalt, the injection well may not be the best or only location where contamination could be reduced. For this reason, if appropriate, efforts would also be made to reduce contamination at other nearby wells and at wells installed as part of the Operable Unit 1-07 groundwater RI/FS or this interim action. Within practical limits, operation of the interim remedial action would be adjusted to remove as much of the contamination as possible. Adjustments in the operation of the system would be made by the DOE in cooperation with the EPA and IDHW.

Table 1: Concentration of Groundwater Contaminants of Concern

Contaminants	Concentration[a]	Drinking Water Standard
Trichloroethylene	2 to 1,300 µg/l	5 µg/l
Tetrachloroethylene	2 to 71 µg/l	5 µg/l
Lead	3 to 515 µg/l	50 µg/l
Strontium	0.002 to 0.23 picocuries/ml	0.008 picocuries/ml

[a] Numbers obtained from sampling wells in the TAN area during late-1989 and 1990.

The interim remedial action would be conducted so the existing environmental problems at this site are not made worse. It would also be conducted so it would not interfere with the final remedy. In fact, it is expected that the interim remedial action would help the development of the final remedy that would consider all the potential threats at this site (Operable Unit 1-07).

What are the Interim Action Alternatives?

The following alternatives for reducing the contamination in the vicinity of the injection well were evaluated.

Alternative 1 - No Action

Alternative 2 - Groundwater Extraction and Treatment by Air Stripping, Ion Exchange, and Carbon Adsorption

Alternative 3 - Groundwater Extraction and Treatment by Carbon Adsorption and Ion Exchange

Alternative 4 - Groundwater Extraction and Treatment by Chemical Destruction and Ion Exchange

Summary of Alternatives

The four alternatives are described in the following paragraphs.

Alternative 1 - No Action

The "no action" alternative is presented as a baseline for comparison against the other alternatives. Under this alternative, DOE would not take any further action to reduce the volume of contamination in the vicinity of the injection well. Additional contaminants would continue to spread from this residual material causing further degradation of the aquifer and possibly making a final remedy considerably more difficult and expensive. However, existing groundwater monitoring, drinking water treatment, and TAN institutional controls would continue.

There would be no immediate costs associated with this alternative.

Alternative 2 - Groundwater Extraction and Treatment by Air Stripping, Ion Exchange, and Carbon Adsorption

With this alternative, groundwater would be pumped from the injection well and possibly one or more other wells within the contaminated groundwater plume. An average pumping rate of about 50 gallons per minute (gpm) is expected with occasionally higher pumping rates of about 100 gpm.

The pumped water would be treated using a filter to remove sediment, an air stripper (see glossary for terms) to remove organic contaminants, and then an ion exchange column to remove radionuclides and inorganics. Gases from the air stripper would be treated with activated carbon to capture the organics. Treated air and water would be monitored and released to the environment once discharge standards were met. The treated water would be discharged into the existing 35-acre disposal pond at TAN and allowed to naturally percolate and evaporate.

Spent carbon would be tested to determine if it is a RCRA hazardous waste. If the carbon is RCRA hazardous, it would be transported off-site in compliance with RCRA subtitle C requirements for generators of hazardous waste. Spent carbon would be recycled through an acceptable off-site regeneration (incineration) facility. The waste ion exchange resins and the filter sediment would be disposed of at the existing low-level waste disposal facility at the Radioactive Waste Management Complex at INEL.

Estimated costs for Alternative 2 are $7,715,000 (see Table 4).

Alternative 3 - Groundwater Extraction and Treatment by Carbon Adsorption and Ion Exchange

This alternative is the same as Alternative 2 except the proposed treatment system is different.

With this alternative, the contaminated groundwater would be treated using a filter to remove sediment, an activated carbon system to remove organics, and then an ion exchange column to remove radionuclides and inorganics. Wastes generated under this alternative would include sediment, activated carbon, and ion exchange resins. The activated carbon would contain both radionuclides and hazardous contaminants and thus may be a mixed waste.

Estimated costs for Alternative 3 are $7,440,000 (see Cost Breakdown Table).

Alternative 4 - Groundwater Extraction and Treatment by Chemical Destruction and Ion Exchange

This alternative is the same as Alternatives 2 and 3 except the proposed treatment system is different.

The contaminated groundwater would be treated using a filter to remove sediment, a chemical treatment system such as ozone and ultraviolet light to destroy the organics, and then an ion exchange column to remove inorganics and radionuclides. Wastes generated under this alternative would include ion exchange resins and sediments.

Estimated costs for Alternative 4 are $7,360,000 (see Cost Breakdown Table).

Common Features for the Alternatives

The remedial alternatives evaluated in this plan have the following common features.

Costs: Except for the no action alternative, all of the alternatives assume a two-year period for the interim remedial action so that costs could be estimated. Any additional remediation after two years would be done under the post-RI/FS remedial action.

Waste Handling: Alternatives 2, 3, and 4 would generate waste materials from investigation and treatment operations. The wastes may include drilling muds and cuttings; development water from well installation; purge water, soil and other material from sample collection; and contaminated protective clothing. Treatment residues would include sediments, prefilter materials, waste carbon, and waste ion exchange resins. All of these materials could be contaminated by organics, inorganics, and radionuclides.

The hazardous and/or radioactive characteristics of these wastes would be determined by sampling and/or prior knowledge of what caused the waste to be generated. This information would be used to decide where the wastes would go for treatment or disposal.

Solid and concentrated liquid wastes would go to existing INEL or off-site facilities for treatment, storage or disposal. These facilities could include but are not limited to the Radioactive Waste Management Complex for low-level radioactive wastes, the Waste Experimental Reduction Facility for mixed wastes, the Central Facilities Area landfill for common trash, and off-site facilities for hazardous wastes (see glossary for terms). However, if these existing treatment or disposal facilities are inadequate, either:

(1) the wastes would be stored in an approved storage area within the area of contamination (the one-mile Waste Area Group One boundary around the TAN facilities) at TAN until additional disposal facilities are available, or

(2) the interim action would be stopped until additional permitted waste storage capacity is available.

Wastewaters generated before the proposed interim action facility is built would be treated at an existing RCRA-permitted water treatment unit at TAN. This existing treatment unit, which will be primarily used during the TAN groundwater RI/FS, has a treatment system similar to the one described in Alternative 3 - a filter to remove sediments, activated carbon to remove organics, and ion exchange resins to remove radionuclides and inorganics.

The treated groundwater would be discharged to the 35-acre TAN disposal pond near the injection well and allowed to percolate and evaporate naturally. Only a portion of the pond would be used because the eastern end has also been contaminated by activities at TAN. The pond would be divided using an earth berm so that treated water could be discharged only to central and western areas of the pond. These areas are unaffected by existing contamination. In this way, contaminants already in the pond would not be pushed deeper into the soil by water coming from the interim action. Existing contamination in the disposal pond is scheduled to be characterized and remediated, if necessary, as another part of the Federal Facility Agreement and Consent Order between the DOE, EPA and IDHW (i.e., under Operable Unit 1-06).

Drill cuttings from the new wells should be non-hazardous and non-radioactive based on cuttings analyzed from 1989 and 1990 well drilling at TAN. These cuttings would be surveyed with field instruments for hazardous and radiological contamination. If the results show no actionable contamination, the cuttings would be disposed of next to the TAN disposal pond.

Other Impacts: Except for the no action alternative, each of the options would also require supporting

facilities or activities that would have a minimal impact on the environment. These impacts would include dust and waste generation during construction (from 1992 to 1993) of a temporary building or modification of an existing building to house the planned treatment facilities, and the drilling of additional wells. Engineering designs and controls would be used to mitigate noise and aesthetic problems.

Comparative Evaluation of Alternatives

The preferred alternative is ***Alternative 2 - Groundwater Extraction and Treatment by Air Stripping, Ion Exchange, and Carbon Adsorption.*** The DOE, EPA, and IDHW are recommending this alternative over the other alternatives after evaluating the first eight of the nine CERCLA criteria given in Table 2. A summary of this evaluation is given in Table 3.

The ninth criterion, which cannot be evaluated in the Plan, is public acceptance. DOE, EPA, and IDHW will use public comments and new information to accept or modify the preferred alternative or possibly to select another alternative presented in this plan or taken from the public review. This decision will be explained in the Interim Action Record of Decision.

The analysis that the DOE, EPA, and IDHW used to evaluate the four alternatives given in this plan is summarized in Table 3 and described in the following sections.

Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health and the environment because further degradation of the environment would continue if no action is taken.

Alternatives 2, 3, and 4 are protective of human health and the environment, and would improve the environment in the TAN area. Each would reduce contamination levels, help prevent further degradation of the groundwater, and would be protective of future groundwater use. These alternatives satisfy this criterion.

Compliance with ARARs

Alternative 1 does not meet applicable or relevant and appropriate requirements (ARARs) of Federal or State environmental laws. Because this alternative does not satisfy either of the first two threshold criteria, it will not be discussed further in this plan.

Table 2: Evaluation Criteria

The NCP requires evaluation of the alternatives against the following nine criteria:

Overall Protection of Human Health and the Environment. Whether a remedy provides adequate protection and how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Federal and State Environmental Standards. Whether a remedy will meet all the applicable or relevant and appropriate requirements (ARARs) of Federal and State environmental statutes, or provide grounds for invoking a waiver.

Long-term Effectiveness and Permanence. The magnitude of any remaining risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume through Treatment. The anticipated performance of the treatment technologies that may be employed.

Short-term Effectiveness. The speed with which the remedy protects human health and the environment, as well as the remedy's potential to create adverse impacts during the construction and implementation period.

Implementability. The technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the selected solution.

Cost. Includes capital, operations, and maintenance.

State Acceptance. Indicates whether, based on its review of the Proposed Plan and supporting documents, the State concurs with, opposes, or has no comment on the preferred alternative.

Community Acceptance. Will be assessed in the Interim Remedial Action Record of Decision following a review of public comments received on the Proposed Plan and supporting documents.

Alternatives 2, 3, and 4 would meet their respective Federal and State ARARs and would satisfy the requirements of this criterion. The treatment facility built under these alternatives would be expected to remove a minimum of 90% of the contaminants in the groundwater before the treated water is discharged to the TAN disposal pond. Air emissions from the facility would be treated to meet State and Federal standards for hazardous air pollutants.

Since these alternatives are interim actions that would support the final remedy, none of the alternatives would meet drinking water standards for the groundwater under TAN. The overall reduction of groundwater contamination at TAN to below drinking water levels would be evaluated as part of the final remedial action under the Operable Unit 1-07 RI/FS. Under all three alternatives, the waste treatment residuals (treated below Best Demonstrated Available Technology requirements) would be delisted (i.e., shown to be non-hazardous waste) and thus no longer subject to RCRA Subtitle C hazardous waste disposal and closure requirements. The waste residuals could then be managed in accordance with the RCRA subtitle D (solid waste) requirements and/or the State solid waste disposal and closure requirements.

Alternatives 2, 3, and 4 would also address useful or recommended procedures for minimizing impacts on archaeological, cultural, environmentally sensitive, and historical resources in the TAN area. In addition, no significant irretrievable resources would be committed and no adverse socioeconomic effects would occur under these alternatives.

Long-term Effectiveness and Permanence

Alternative 2 would have the best long-term effectiveness and permanence because it would use incineration to destroy organic contaminants, thus reducing long-term waste management needs. Although Alternative 3 is an effective and accepted approach to reducing risk, it is less reliable in the long-term because of the inherent hazard of managing mixed wastes. Alternative 4 does destroy organics, so it has good long-term waste disposal effectiveness, but its complex design would require special engineering and construction techniques that may reduce its long-term operating effectiveness.

Since this is a temporary action, permanence in terms of the final response action on the groundwater would be determined by the Operable Unit 1-07 RI/FS.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 2 and 4, through destruction of the organic contaminants by regeneration (incineration) or chemical destruction, provide the best reduction of toxicity and volume. Alternative 3, by fixing both organics and radionuclides onto the carbon, would need to be handled as a mixed waste. The only acceptable disposal option for this mixed waste carbon

Table 3: Comparative Evaluation of Alternatives

Interim Action Alternatives Evaluation Criteria	Alternative #2: Extraction and Treatment by Air Stripping, Ion Exchange, and Carbon Adsorption	Alternative #3: Extraction and Treatment by Carbon Adsorption and Ion Exchange	Alternative #4: Extraction and Treatment by Chemical Destruction and Ion Exchange
Long-term Effectiveness	●	○	◒
Reduction of Toxicity, Mobility, or Volume Through Treatment	●	○	●
Short-term Effectiveness	●	◒	○
Implementability	◒	●	○
Cost	○	◒	●

● = Best ◒ = Good ○ = Poor

Table 4: Cost Breakdown for the Alternatives

Activity	Costs, $		
	Alternative 2 Treatment by Air Stripping, Ion Exchange, Carbon Adsorption	**Alternative 3** Treatment by Carbon Adsorption and Ion Exchange	**Alternative 4** Treatment by Chemical Destruction and Ion Exchange
Facility Design[1]	600,000	600,000	650,000
Well Drilling[2]			
Well Conversion	207,000	207,000	207,000
Monitoring Wells	226,000	226,000	226,000
Waste Disposal	42,000	42,000	42,000
Subtotal	475,000	475,000	475,000
Plant Costs			
Building, piping	575,000	575,000	575,000
Process Equipment	975,000	655,000	520,000
Start-up Pump Test	166,000	166,000	166,000
Field Supervision	132,000	132,000	132,000
Subtotal	1,848,000	1,528,000	1,393,000
Two year Operating Costs[3]			
Operating Labor	1,188,000	1,188,000	1,400,000
Technical Support	196,000	196,000	196,000
Supplies/Material	520,000	460,000	480,000
Analytical Costs	520,000	520,000	520,000
Waste Disposal	320,000	480,000	280,000
Project Supervision	470,000	470,000	470,000
Subtotal	3,194,000	3,294,000	3,326,000
Plant Decontamination	176,000	176,000	176,000
Contingency[4]	1,422,000	1,367,000	1,340,000
Total	7,715,000	7,440,000	7,360,000

[1] Design includes costs ($25,000 for Alternatives 2 and 3, and $50,000 for Alternative 4) for the small-scale design studies needed to improve actual performance of the treatment plant.

[2] Well drilling would include conversion of five existing wells to monitoring or water level wells, drilling of two new monitoring wells near the injection well, and waste treatment and disposal of the investigation-derived wastes. These wells will be in addition to the wells drilled under the RI/FS.

[3] The two year operational limit was selected because by that time the RI/FS remedial action treatment process will be designed, constructed, and ready for operation.

[4] Contingency (25%) covers uncertainties in construction and operating costs only.

would be complete destruction in a special incinerator that could also capture the radionuclides.

Short-term Effectiveness

Alternative 2 is anticipated to have the greatest short-term effectiveness. Alternative 2 presents the least amount of risk to workers, the community, and the environment because it relies on a proven remedial technology which would minimize the likelihood of equipment failure and because it would probably not generate mixed waste.

Although Alternatives 2 and 3 are similar with respect to remedial technology, Alternative 3 would generate more mixed waste which would require more complex handling procedures that could increase the risk to workers in the event of an accident.

Alternative 4 has the disadvantage of requiring more extensive bench- or pilot-scale studies than the other alternatives before the larger scale treatment system could be designed. In addition, this alternative would require more complex technology which would increase the risk to the workers and of a contaminant release to the environment if a failure occurred.

None of the alternatives could begin operation until 1993 to allow sufficient time for design and construction of the operating and treatment facilities. Alternatives 2 and 3 would require less time to achieve short-term protection because they would use readily available design and treatment technologies that are specifically demonstrated for treating contaminated groundwater. Alternative 4 would require more time to ensure that the chemical treatment equipment was properly designed and to obtain the necessary equipment.

Implementability

Alternatives 2 and 3 would be the simplest to implement. Both would require readily available engineering services and construction materials. However, Alternative 2 has more operational requirements than Alternative 3 because of the air stripper. As with the other alternatives, because of the fractured basalt aquifer, additional groundwater wells may be installed or utilized and the components of the treatment alternatives may have to be modified to implement the interim remedial action or to evaluate the effectiveness of the extraction system in the aquifer.

The Alternative 2 spent carbon would be regenerated off-site at an acceptable disposal facility.

Alternative 4 is the most complex alternative to design and construct. However, despite anticipated frequent downtime due to technical complexity, this alternative would require minimal handling of waste residue.

Cost

Estimated costs are shown in Table 4. Equipment costs caused the biggest differences between the alternatives. As a result, Alternative 4 is the least expensive choice, followed by Alternative 3 and then Alternative 2. Detailed assumptions for the costs shown in Table 4 are contained in the Administrative Record. These costs could change based on final design and more detailed cost itemization.

State Acceptance

IDHW has been involved in the preparation of this Proposed Plan and comments received have been incorporated.

Community Acceptance

Community acceptance of the preferred alternative and the other alternatives will be evaluated after receipt of comments on the proposed plan. DOE, EPA, and IDHW will review and consider public comments on this plan and will incorporate comments in the process that will lead to the Record of Decision. Responses to public comments will be provided in the Responsiveness Summary.

Summary of the Preferred Alternative

In summary, DOE, EPA, and IDHW selected *Alternative 2 - Groundwater Extraction and Treatment by Air Stripping, Ion Exchange, and Carbon Adsorption* as the preferred alternative for the proposed interim action on the injection well and the groundwater contamination. This alternative is preferred because it best meets the key requirements of the first eight criteria required by CERCLA for remedial actions (see Table 3) and because all three types of contaminants would be actively removed from the groundwater. Alternative 2 would also not produce significant amounts of mixed wastes in comparison to the other alternatives.

The preferred alternative would include:

- Pumping the injection well and possibly other wells in the area at about 50 gpm (maximum 100 gpm) to reduce the contaminant levels and migration in the groundwater
- Treatment of the groundwater by filters, air stripping with carbon adsorption, and ion exchange to remove organic, inorganic, and radionuclide contaminants
- Sediments, waste ion exchange resins, and spent carbon would be disposed of at the INEL or other off-site facilities as available
- Discharge of treated water to an existing disposal pond for evaporation and percolation
- Monitoring of interim action performance using other wells in the TAN area to provide design and cost information for the final remedy.

Public Involvement Opportunities

Public input is critical to the CERCLA process, and the DOE, EPA, and IDHW encourage you to participate in the remedy selection process. The following public involvement activities or opportunities have been, or will be, available:

Public Meetings - During the 30-day comment period, three public meetings are scheduled as listed on page 13. Verbal comments on the Proposed Plan will be accepted at those meetings.

Written Comments - Written comments are encouraged and should be addressed to the DOE-Idaho Environmental Restoration and Waste Management office listed on this page. Written and verbal comments will be given equal consideration. All comments, verbal or written, will be addressed in the Responsiveness Summary portion of the Record of Decision scheduled for the winter of 1991-1992 and will become part of the Administrative Record.

Questions - If you have questions concerning the Proposed Plan or other INEL issues, please call the INEL Community Relations Office at the phone number listed below.

Addresses

For submission of written comments:

Mr. Jerry Lyle, Acting Deputy Assistant Manager
Environmental Restoration and Waste Management
DOE Idaho Field Office
785 DOE Place, MS 3902
Idaho Falls, ID 83401-1562

For additional information:

Mr. Reuel Smith
INEL Community Relations Office
785 DOE Place, MS 3902
Idaho Falls, ID 83401-1562
(208) 526-6864

Mr. Wayne Pierre
Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Mr. Dean Nygard
Idaho Department of Health and Welfare
Division of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Information Repositories

Additional Information is contained in the Administrative Record for the Interim Action. Those documents can be reviewed at any of the information repositories listed below.

INEL Technical Library
1776 Science Center Dr., Idaho Falls

Idaho Falls Public Library
457 Broadway, Idaho Falls

Pocatello Public Library
812 East Clark St., Pocatello

Boise Public Library
715 S. Capital Blvd., Boise

Twin Falls Public Library
434 2nd Street East, Twin Falls

Moscow-Latah County Library
110 S. Jefferson, Moscow

Acronyms and Glossary

Action Plan - Federal Facility Agreement and Consent Order (FFA/CO) document which defines the schedule and procedures for implementing the Interagency Agreement, the agreement between DOE, EPA, and the State of Idaho implementing CERCLA at the INEL.

Activated Carbon - Remedial technology where organic, inorganic, and radionuclide contaminants are removed from air or water by pieces of carbon slightly bigger than sand particles.

Administrative Record - Documents including correspondence, public comments, Record of Decision, technical reports, and others upon which DOE, EPA, and IDHW base their remedial action selection.

Air Stripping - Remedial technology where air is forced through the water to remove organic contaminants. The dirty air is then cleaned before being released to the environment.

ARARs - (Applicable or Relevant and Appropriate Requirements) - The Federal and State laws that are legally applicable or relevant and appropriate under the circumstances.

Area of contamination - The aerial extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the remedy. For TAN, this area is defined as the area enclosed by the Waste Area Group One boundary which extends one mile from the TAN facilities.

Central Landfill - Solid waste disposal facility located near the Central Facilities Area on the INEL. This facility accepts non-hazardous and non-radioactive trash, debris, and other wastes for disposal.

CERCLA - (Comprehensive Environmental Response, Compensation, and Liability Act, commonly called Superfund, implemented by 40 CFR 300) - Act which establishes a program to identify sites where hazardous substances have been, or might be, released into the environment and to ensure that they are remediated.

Chemical Treatment - Remedial technology where chemicals and high intensity light are used to destroy organics in contaminated groundwater.

Contaminants of Concern - Hazardous and radioactive substances that have the most risk to human health and the environment at this site.

HWMA - (Hazardous Waste Management Act) - Idaho's law which governs hazardous waste.

Interim action - Actions to remediate sites in phases using operable units as early actions to eliminate, reduce, or control the hazards posed by a site or to expedite the completion of total site remediation.

Ion exchange - Remedial technology where small resin beads take metals and radionuclide particles out of contaminated water. The contaminants are taken out of the water and "exchanged" with non-hazardous materials such as sodium.

Mixed waste - Wastes containing quantities of hazardous and radioactivity substances which exceed the regulatory definitions of what is hazardous and what is radioactive.

mrem - One-thousandths of a Roentgen-equivalent-man, a unit of radiation which relates to biological damage in the human body due to radiation.

NCP - (National Contingency Plan, 40 CFR 300) - The basic policy directive for federal response actions under CERCLA, including the procedures and standards for responding to releases of hazardous substances.

National Priorities List - A list of sites designated as needing long-term remedial action, whose purpose is to inform the public of the most serious hazardous waste sites in the nation.

Operable Unit - Areas or a group of sites defined by geographic features, contaminant boundaries, or other features distinguishing the area/sites as a distinct problem.

picocurie - One-trillionth of a curie. Commonly used as a measure of radioactive strength.

Proposed Plan - Document requesting public input on a proposed remedial alternative.

Radioactive Waste Management Complex - is a facility in the southwestern part of the INEL (see Figure 1 in the main body of the text). This facility

accepts low-level radioactive waste for storage and disposal.

RCRA - (Resource, Conservation and Recovery Act, implemented by 40 CFR 260) - Act which defines hazardous waste and the requirements for dealing with hazardous waste.

Record of Decision - Document which is a consolidated source of information about the site, the remedy selection process, and the selected remedy for a remedial action under CERCLA. Contains the Responsiveness Summary (see below).

Responsiveness Summary - The part of the Record of Decision (see above) which summarizes comments received from the public and provides DOE, EPA, and IDHW an opportunity to comment "on the record".

RI/FS - (Remedial Investigation/ Feasibility Study) - A document which describes the characterization of the nature and extent of contamination and the evaluation of potential remedial options.

Risk Assessment Scenarios - A range of conditions used to determine how much risk people would potentially experience from being exposed to those conditions. For example, the external exposure risk assessment scenarios for the human health risk evaluation for this Proposed Plan ranged from 365 days a year, 40% of the time, for 40 years, to 1 hour per day, 5 days per week, for one year.

Sedimentary interbeds - are continuous or discontinuous layers of material deposited by water or wind. These layers were subsequently covered by basalt or additional sedimentary material. At the INEL, the sedimentary interbeds are generally less permeable to water than the layers of fractured basalt.

SARA - (Superfund Amendments and Reauthorization Act) - Act signed into law in 1986 and which increases the level of public and state involvement in the CERCLA process.

Waste Experimental Reduction Facility - is an incinerator that could burn radioactive and mixed waste to destroy hazardous and burnable material and captures the radioactive material for disposal at the Radioactive Waste Management Complex. Waste Experimental Reduction Facility is located in the southeastern part of the INEL (see Figure 1 in the main body of the text).

Public Comment Needed on Contaminant Reduction in the TAN Groundwater

DOE, EPA, and IDHW are currently seeking public comment on a Proposed Plan to reduce the contamination near the injection well and in the groundwater at the Test Area North at the Idaho National Engineering Laboratory. This Proposed Plan describes the alternatives considered and the alternatives preferred by DOE, EPA, and IDHW. The public comment period is January 13 to February 12, 1992. Written comments can be sent to Jerry Lyle, Acting Deputy Assistant Manager of the Environmental Restoration and Waste Management office at the Department of Energy Idaho Field Office, at the address on page 11. Verbal comments will be recorded at each of the public meetings listed below.

Public Meetings on Proposed Plan

Idaho Falls - February 4, 1992 at the Westbank Inn.

Boise - February 5, 1992 at the Boise Public Library.

Burley - February 6, 1992 at the Burley Inn.

Waste Management Plan

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WASTE MANAGEMENT PLAN
FOR THE TEST AREA NORTH GROUNDWATER OPERABLE UNIT
AT THE IDAHO NATIONAL ENGINEERING LABORATORY

May 1992

Idaho National Engineering Laboratory
EG&G Idaho, Inc.
Idaho Falls, Idaho 83415

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WASTE MANAGEMENT
FOR THE TEST AREA NORTH GROUNDWATER OPERABLE UNIT
AT THE IDAHO NATIONAL ENGINEERING LABORATORY

1. NEED AND PURPOSE

In 1989, the Idaho National Engineering Laboratory (INEL) was placed on the National Priorities List (NPL) of sites to be cleaned up under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The contaminated groundwater under the Test Area North (TAN) was one of the concerns that led to listing the INEL on the NPL. The remedial investigation/feasibility study (RI/FS) described in the RI/FS work plan is part of the effort to delist the INEL from the NPL.

This report on waste management is intended to describe how the Department of Energy (DOE) will handle, store, treat and dispose of investigation-derived wastes generated during CERCLA activities in the TAN groundwater. These wastes include treatment residuals, personal protective equipment, and treated water.

The principal source of the groundwater contamination is the 305-ft-deep TAN injection well located in the southwestern corner of the Technical Support Facility (TSF) at TAN (Figure 1-1). The injection well was used from 1955 to 1972 to dispose of TAN liquid wastes and concentrated evaporator sludges into the fractured basalt of the Snake River Plain Aquifer. After 1972, the liquid wastes were discharged to the TSF disposal pond. The liquid wastes included organic and low-level radioactive wastewaters that were added to nonhazardous industrial and sanitary wastewaters from the TAN facilities. Groundwater contaminants include trichloroethylene (TCE), tetrachloroethylene (PCE), lead, tritium, and strontium. Activities that generated these wastes included testing and evaluation of materials for a nuclear powered aircraft and from different types of experimental nuclear reactors.

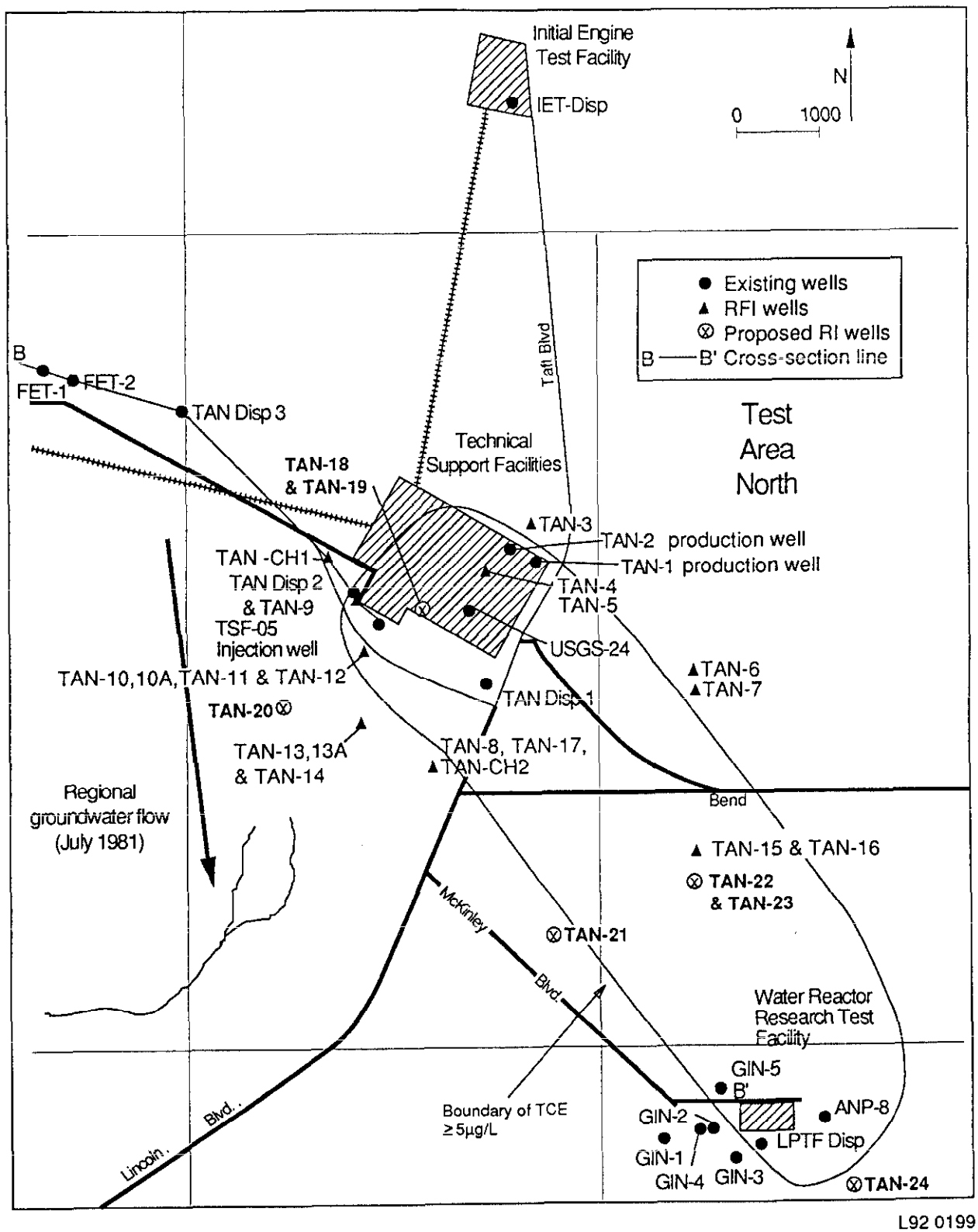

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Figure 1-1. Diagram of well locations at Test Area North (including the contaminant plume boundary).

The highest groundwater contamination levels are found near the injection well, and these levels drop rapidly as the distance from the well increases. In the 30 years since the well started operation, the TCE may have travelled as far as 1-1/2 mi in the direction of groundwater flow (south to southeast—see Figure 1-1). In contrast, the other contaminants of concern have not been found above drinking water standards approximately 3/4 mi from the well for the organics, and 1/4 mi for the metals and radionuclides. Contaminants have also been found from the groundwater surface 200 ft below TAN to at least 400 ft below the ground surface.

The original uses of the trichloroethylene, tetrachloroethylene, and several other organics found in the TAN groundwater cannot be clearly identified at this time. The DOE has made the determination that these organics are therefore not considered to be listed chemicals as described in 40 Code of Federal Regulations Part 261 under the Resource Conservation and Recovery Act (RCRA).

The purpose of the proposed actions described in this Waste Management Plan is to investigate the extent and fate of the contamination in the groundwater, so that alternatives can be evaluated for reducing groundwater contamination. The proposed actions would include:

- Treatment of investigation-derived wastes generated during the RI/FS investigation of the contaminated aquifer from 1992 to 1994 using an existing 8 gallon per minute (gpm) RCRA permitted, mixed wastewater treatment plant at TAN
- Treatment, storage, and disposal of investigation-derived wastes generated during these activities.

2. DESCRIPTION OF THE PROPOSED ACTION

The RI/FS actions and waste handling required under the CERCLA process (as outlined in the FFA/CO Action Plan) are described in detail below. Table 2-1 summarizes the treatment, storage, and disposal options for the investigation-derived wastes that will be generated during these actions. Section 2.2 describes actions that would be taken if any of the treatment, storage, and disposal facilities are not available.

2.1 DESCRIPTION OF THE RI/FS ACTIVITIES

The investigative portions (well sampling, drilling, and testing) and waste treatment of the RI/FS are covered under this waste management report.

Wastewater volumes from the approved RI/FS activities include up to 250,000 gallons from two rounds of sampling of up to 40 wells each and 250,000 gallons from drilling and testing up to eight wells for a total of about 500,000 gallons from 1992 to 1993. Seventy percent of the wastewaters would contain trichloroethylene and other organics at less than 1,000 µg/l, radionuclides at less than 1,000 picocuries/l, and tritium at less than 10,000 picocuries/l. The rest of the wastewater would have up to 30,000 µg/l trichloroethylene and other organics, up to 3,000 picocuries/l of radionuclides, and up to 50,000 picocuries/l of tritium. Treatment of the water from well development and initial sampling would be done in the existing RCRA treatment plant at TAN. The 500,000 gallons of treated water discharged over 2 years would not increase the wetted area of the modified TSF disposal pond.

The estimated waste treatment, storage, and disposal options for the investigation-derived wastes from the RI/FS are summarized in Table 2-2. Appendix A contains the assumptions that were used in developing the table.

Sampling water from wells that have contained no radioactivity and have had concentrations of other contaminants at or below background levels will be disposed of without treatment next to the wells. These wells are typically greater than 2 miles from the TSF facility. An additional criteria will be

that drinking water standards for the contaminants of concern cannot have been exceeded based on 1989 and 1990 sampling data.

Table 2-1. Waste treatment, storage, and disposal options for TAN Groundwater RI/FS[a]

Waste	Media	Generated from:	Potential Hazardous or Radioactive Contaminants[b]	Treatment	Storage[c]	Disposal
Well purge, well development, and decontamination water	Water	Sampling, well development, or decontamination	TCE, Sr-90, tritium	TAN PWTU	at TAN CERCLA facility	TAN disposal pond
TCLP/CLP Semi-volatile analysis wastes[d]	Liquid, Soil, and Solid	Sampling	Semi-VOAs, Sr-90, tritium, methylene chloride	Recycling or incineration	at TAN CERCLA facility	Off-site or on-site facility
TCLP/CLP metal analysis wastes[d]	Liquid, Soil, and Solid	Sampling	lead, Sr-90, tritium, nitric acid	neutralization then TAN PWTU (liq) or grouting, if needed, then disposal (solids)	at TAN CERCLA facility	TAN disposal pond - liquid RWMC - rad AOC - nonrad/non-haz
TCLP/CLP pesticide or herbicide analysis wastes[d]	Liquid, Soil, and Solid	Sampling	Sr-90, tritium, hexane	liquid adsorption then incineration	at TAN CERCLA facility	RWMC - rad AOC - nonrad/non-haz
TCLP/CLP volatile analysis wastes	Liquid, Soil, and Solid	Sampling	TCE, PCE, VOAs, Sr-90, tritium	TAN PWTU (liq) or incineration, if needed, then disposal (solids)	at TAN CERCLA facility	TAN disposal pond - liquid RWMC - rad AOC - nonrad/non-haz
Alpha/beta and inorganic analysis wastes	Liquid, Soil, and Solid	Sampling	lead, Sr-90, tritium, acids	neutralization then TAN PWTU (liq) or grouting, if needed, then disposal (solids)	at TAN CERCLA facility	TAN disposal pond - liquid RWMC - rad AOC - nonrad/non-haz
Field test analysis wastes	Liquid and Soils	Sampling	TCE, lead, Sr-90, tritium	TAN PWTU (liq) or grouting, if needed, then disposal (solids)	at TAN CERCLA facility	TAN disposal pond - liquid RWMC - rad AOC - nonrad/non-haz
Drill cuttings	Soil	Well drilling	TCE, Sr-90, tritium, cesium-137	field survey organics and rad. If rad or hazardous, grouting or incineration	at TAN CERCLA facility	RWMC - rad AOC - non-rad/non-haz
Activated carbon	Solid	Process Equipment	TCE, PCE, Sr-90, CS-137, CO-60	incineration and recycling	at TAN CERCLA facility	RWMC - rad Off-site facility - non-rad
Prefilters	Solid	Process Equipment	TCE, Sr-90, CS-137, CO-60	incineration	at TAN CERCLA facility	RWMC - rad

Waste	Media	Generated from:	Potential Hazardous or Radioactive Contaminants[b]	Treatment	Storage[c]	Disposal
Sediment or sludge from injection well	Solid	Process Equipment, Sampling	TCE, Sr-90, tritium, CS-137, CO-60	incineration or grouting	at TAN CERCLA facility	RWMC after successful treatment
Ion exchange resin	Solid	Process Equipment	Sr-90, CS-137, CO-60	None	at TAN CERCLA facility	RWMC
PPE; solid wastes; used sampling equipment; and contaminated piping, drums, tanks, hoses	Solid	Sampling and waste storage	Sr-90, CS-137, CO-60	Decon material, field rad survey, send to disposal facility	at TAN CERCLA facility	RWMC - radioactive Central landfill or off-site - if non-hazardous

Note: Only four to five 55-gal drums of mixed waste are expected to be generated in 1992 from these activities, primarily activated carbon and prefilters. All these wastes are expected to be combustible.

a. Treatment, storage, and disposal options given are the preferred choice. If these facilities or options are not available, equivalent facilities or options will be used, or the wastes will be stored at the TAN CERCLA storage facility until treatment or disposal options are available, or until the final Waste Area Group 1 comprehensive RI/FS ROD is signed.

b. The contaminants listed are those that could potentially be found in the waste at levels above RCRA characteristic limits for hazardous contaminants or above detection limits for radioactive contaminants. These contaminants may not be found in the wastes. If these contaminants are not found, the identified treatment, storage, or disposal option would not have to be implemented.

c. The TAN CERCLA storage facility would be located within the area of contamination at TAN (area within 1 mile from the facilities). This storage facility will be located in an existing building or a new building at TAN, so that RCRA substantive requirements can be met. Wastes stored in this facility will not incur placement under RCRA.

d. As part of these laboratory analysis methods, certain chemicals are used to improve the efficiency of the analysis process (i.e. methylene chloride is added for semi-volatile analyses, acid for metals and inorganics, and hexane for pesticides and herbicides). If the laboratory detects radioactive contamination in the analysis waste, these chemicals would be returned to the INEL. These wastes would be small in volume (less than 100 ml per sample), so the waste would be stored similar to Note (a) until sufficient volume is available for the identified treatment option.

2.2 Description of the Treatment and Management Actions for the Generated Wastes

2.2.1 Disposal Facilities and Waste Treatment Residuals

The treatment and management options for the generated wastes would involve existing facilities at INEL.

The two key facilities that would be used during the proposed actions would be the WERF treatment facility for combustible mixed and low-level radioactive wastes (this assumes WERF is authorized to operate by the summer of 1994), and RWMC for disposal of the low-level, non-combustible radioactive wastes from TAN and the incinerator residues from WERF. No non-combustible mixed wastes have been generated during previous actions or are expected to be generated during the proposed actions. If RWMC or WERF are not available, other INEL-designated facilities would need to be used (see Section 2.4 for limitations).

Where possible, and if required by RCRA, waste treatment residuals would be treated below Best Demonstrated Available Technology requirements (i.e., shown to be non-hazardous waste) and thus no longer subject to RCRA Subtitle C hazardous waste disposal and closure requirements. The waste residuals could then be managed in accordance with the RCRA subtitle D (solid waste) requirements and/or the State solid waste disposal and closure requirements. This residual treatment policy would apply to residuals from WERF, the existing RCRA permitted treatment facility, and any off-site treatment facilities.

2.2.2 Impact of the Maximum Annual Waste Volumes and Capacity Limitations on the Proposed Actions

An annual breakdown of waste types and volumes is given in Table 2-2. The maximum potential impacts are discussed below. The maximum volume of low-level radioactive, noncombustible wastes going to RWMC or another

Table 2-2. Annual volume of wastes generated during the proposed activities

Waste Type[a]	1992	1993	Total	Stored at	Disposed at[b]
Mixed (55-gal drums)	3	1	4	AOC at TAN	WERF
Radioactive - Combustible (55-gal drums)	5	1	6	AOC at TAN	WERF
Radioactive - Noncombustible (55-gal drums)	6	4	10	AOC at TAN	RWMC
Hazardous (55-gal drums)	-	-	-	AOC at TAN	Off-site
Solid Waste (cubic yards)	-	-	-	AOC at TAN	Landfill
PPE (55-gal drums)	25	11	36	AOC at TAN	Landfill
Drill Cuttings - Radioactive (cubic feet)	120	-	120	AOC at TAN	RWMC
Drill Cuttings - Nonradioactive (cubic feet)	580	-	580	AOC at TAN	Backfill
Contaminated Water - TAN PWTU (1,000 gals)	500	-	500	TAN PWTU	TSF disposal pond

a. Contaminated water will be treated to below drinking standards or to a 90% contaminant removal standard before discharge.

b. Disposal sites listed are the preferred alternative. If these sites are not available, wastes will remain at the designated storage location until a disposal option is identified (See Table 2-1 also).

Acronyms:

AOC - Area of Contamination - this will be a temporary storage area at TAN.
BRC - Below Regulatory Concern - air emissions will be below regulatory limits.
N/A - Not Applicable.
TAN PWTU - Test Area North Portable Water Treatment Unit.
WERF - Waste Experimental Reduction Facility. Treatment wastes from WERF will be disposed at the RWMC.
RWMC - Radioactive Waste Management Complex. Low-level radioactive waste disposal area at the INEL.

INEL-designated low-level radioactive disposal facility from all the proposed actions would be 10 drums of ion exchange resins and 120 ft^3 of drill cuttings. The maximum volume of mixed waste or combustible radioactive waste going to WERF or another mixed waste treatment facility would be 10 drums. The maximum volume of PPE would be 36 drums. The impact of these waste volumes on the facilities in relation with other remedial actions at the INEL is briefly discussed in Section 3.

If the activated carbon is only hazardous, it would be sent off-site for treatment and disposal. Spent carbon that meets RCRA hazardous waste criteria would be transported off-site in compliance with RCRA subtitle C requirements for generators of hazardous waste. Spent carbon would be recycled through off-site regeneration (incineration) at a facility operated in compliance with EPA's off-site disposal policy. If the activated carbon is a mixed waste, it will be sent to WERF for incineration.

If capacity at any of these existing facilities is not available, either:

1. The wastes would be stored within the area of contamination (the area of contamination at TAN is defined as the area enclosed by the Waste Area Group (WAG) 1 boundary which extends 1 mile from the TAN facilities) at TAN until additional disposal facilities are available, or

2. The work would be stopped until additional waste storage and disposal capacity is available.

The wastes in the area of contamination would be stored in a facility that meets the substantive requirements of RCRA.

2.2.3 Soil Disposal Criteria

Soil (drill cuttings, samples, excavated material, etc.) disposal criteria would be based on drill cutting sampling that occurred during the RCRA Facility Investigation activities in both 1989 and 1990. Drill cuttings from both years were analyzed using the Toxic Characteristic Leach Procedure (TCLP)

for organics and metals, and radiological analysis for radionuclides. No contaminants exceeded or even approached any TCLP action levels. Radionuclides (<1 picocurie/gm) were detected in the cuttings from only one well which had been drilled within 300 feet of the injection well. All other drill cuttings had no detectable levels of radionuclides. These analytical results match the known distribution and levels of the contaminants in the groundwater.

The drill cuttings from all proposed wells greater than 500 feet from the injection well would be surveyed with an organic vapor analyzer (HNu or equivalent), and a Ludlum 2A for beta/gamma and a Ludlum 61 (or equivalent) for alpha-emitting radionuclides. If field surveys for organics exceed 25 ppm, cuttings would be containerized, and samples would then be submitted for contaminant analysis by an off-site laboratory. If field surveys for beta/gamma radiation exceed 100 counts per minute or if any alpha radiation is detected, the drill cuttings would be containerized, sampled, analyzed for specific radionuclides. Potentially contaminated drill cuttings would be stored at TAN within the area of contamination in a radiologically-controlled area until laboratory results are available. Depending on sample results, these drill cuttings would be disposed of at the RWMC or another INEL-designated facility. Uncontaminated drill cuttings or soils would be used as backfill in the area around the TSF disposal pond.

2.2.4 Treated Water Disposal Criteria

Contaminated groundwater from activities such as well drilling and well sampling would meet a minimum performance standard of a 90% reduction in the concentrations of the contaminants of concern for water discharged to the TSF disposal pond. These standards were negotiated between the DOE, EPA, and the State of Idaho during scoping meetings for the interim action in December 1991.

2.2.5 Air Disposal Criteria

Air emissions from the treatment facilities operated under the RI/FS would be required to meet federal standards for radionuclide emissions and hazardous

air pollutant emission standards. State guidelines for hazardous air emissions would be considered. Appendix B contains air emission analyses performed for both the TAN Portable Water Treatment Unit and several other tasks under the RI/FS. These air emission analyses show that all air emissions will be below regulatory concern levels.

2.2.6 Personal Protective Equipment Waste Minimization and Disposal

PPE would be generated during most of the activities described above. The PPE would be segregated in accordance with EG&G Idaho, Inc. and DOE waste minimization requirements. Contaminated PPE would be cleaned of hazardous contamination, if possible, surveyed with field radiation instruments, and disposed as cold or low-level radioactive waste as appropriate. Cold waste would go to the landfill or another INEL-designated solid waste landfill. Low-level radioactive waste would be stored and then volume reduced at WERF when that facility becomes operational. No hazardous or mixed PPE would be generated during the proposed actions based on the planned segregation and cleaning actions and based on experience from the 1990 well program. Total PPE generation would be 36 drums of PPE.

2.2.7 Other Waste Types and Disposal Criteria

Small volumes of other wastes (decontamination waters, sample preservatives, laboratory samples) generated during these proposed actions would be treated, stored, and disposed according to their waste characteristics (see Table 2-1). An estimated total of 20 drums of decontamination water would be generated. The decontamination water would be treated at the existing RCRA 8 gpm treatment plant with no significant process waste generation. About 5 gallons per year of preservatives and other concentrated non-radioactive wastes would be analyzed and disposed of at off-site EPA-permitted disposal facilities as described in Table 2-1.

Laboratory samples sent to off-site laboratories would be disposed of according to the laboratory standard policy unless they are radioactively contaminated. These samples would be returned to the INEL for disposal as described in Table 2-1.

3. RELATIONSHIP WITH OTHER ACTIONS

No other CERCLA remedial activities at TAN are expected to overlap with the proposed actions described in this analysis for the foreseeable future. All other possible or planned remedial activities would be evaluated in the overall WAG 1 comprehensive RI/FS which would not be completed until 1998. Several planned assessment activities would be occurring in the TAN area at the same time as these remedial activities. These activities would be limited to sample collection work in areas that are not directly related to the groundwater contamination and would not have any significant impact on the remedial actions.

Remedial activities in other parts of the INEL would be occurring at the same time as this groundwater remedial action. However, these other actions would be located in the southwestern portions of the INEL at least 25 mi from TAN. Given the distances involved, these actions can be considered as being completely independent of each other except in the area of waste management. INEL-wide Waste management is being addressed separately by DOE. Maximum waste generation rates for these proposed actions are given in Section 2.2.

APPENDIX A

ASSUMPTIONS FOR DATA GIVEN IN SECTION 2 TABLES

APPENDIX A

ASSUMPTIONS FOR DATA GIVEN IN SECTION 2 TABLES

Table 2-2

- 100 cubic feet of drill cuttings per well based on 4-inch wells, 500 feet deep, with 6-inch bore holes. Total drill cuttings generated would be 800 cubic feet. Ten percent of these cuttings or 80 cubic feet would be radioactively-contaminated based on cuttings sampled in 1990. The rest (720 cubic feet) would be non-radioactive.
- None of the drill cuttings would be hazardous based on samples analyzed from 1990 drill cuttings.
- One drum of PPE would be generated per well drilled for a total of 8 drums.
- Four drums of PPE would be generated per sampling round for a total of 8 drums.
- The lower water contamination levels are based on 1990 field data from wells farther from the injection well (about 70% of the wells). The higher water contamination levels are based on 1991 samples taken from water decanted off sludge from the injection well. Wells within 1/2 mile of the injection well (30%) could have concentrations near these levels.
- Treatment of the well development and well sampling waters would generate one 55-gal drum of spent prefilters, one drum of activated carbon, two drums of ion exchange resins, and three drums of PPE for every 50,000 gallons of water treated at the PWTU. This estimate is based on operating the PWTU during 1989 and 1990.

APPENDIX B

AIR EMISSION ANALYSES FOR THE TAN PWTU AND THE REMOVAL OF THE HOSE FROM THE INJECTION WELL

APPENDIX B

AIR EMISSION ANALYSES FOR THE TAN PWTU AND THE REMOVAL OF THE HOSE FROM THE INJECTION WELL

AIR EMISSION ANALYSES FOR THE TAN PWTU

Introduction

The Test Area North (TAN) Portable Water Treatment Unit (PWTU) has been designed to remove organic, metal, and radionuclide contamination from wastewaters generated at the Idaho National Engineering Laboratory. The TAN PWTU is currently operating under Resource Conservation and Recovery Act (RCRA) interim status. The part A permit for the TAN PWTU authorizes treatment and storage of wastewaters containing hazardous levels of all 40 Toxic Characteristic Leaching Procedure (TCLP) constituents (D004 - D043) with and without radionuclides. In addition, the TAN PWTU can treat non-hazardous levels of other organics such as methylene chloride, toluene, and the other chemicals listed in Table B-1.

From a safety viewpoint, the TAN PWTU is limited to treating wastewaters that will not cause personnel exposure limits to be exceeded in case of a spill inside the facility. In practical terms, this limit keeps contaminant concentrations below 100 mg/l depending on contaminant volatility. This limit is enforced by requiring prior sampling data or process knowledge on all wastewaters delivered to the TAN PWTU.

The TAN PWTU can physically treat up to 8 gallons per minute, but this rate is adjusted, based on initial concentrations of contaminants in the wastewater, to improve treatment performance. The facility is primarily used during the field season and is shutdown during the winter.

Emissions from the Treatment Process

The TAN PWTU treatment process includes two prefilters to remove solids, two activated carbon canisters to remove organics (also some of the metals and radionuclides), and three ion exchange columns to remove radionuclides. All of these processes are completely contained. All of the fittings are pressure tested for leaks. Therefore, no air emissions occur from the treatment equipment.

Treated Water Holding Tanks

All water treated in the TAN PWTU is placed in holding tanks up to 8,000 gallons in size. Treated water samples analyzed for radionuclides and organics have shown maximum levels of organics in the 200 part per billion (ppb) range, metals less than 30 ppb, and no detectable radionuclide contamination. No detectable levels of organics have been found in the headspace above the treated water, so air emissions from these tanks are negligible.

The potential for partially treated water being exposed to the atmosphere is not a significant concern at the TAN PWTU. As part of the facility standard operating procedures, pumping rates are typically adjusted during processing to improve treatment performance and prevent discharges of partially treated water. Field samples of the treated water are also analyzed for gross gamma radiation and organics within a few hours of completing treatment. If levels of radionuclides or organics are found that exceed discharge standards, the water is reprocessed within 72 hours and reanalyzed. So far, the TAN PWTU has removed all contaminants to below 200 ppb on the first treatment cycle. Therefore, only negligible levels of emissions will occur from the treated water holding tanks due to partially treated water.

Equipment Maintenance

After hazardous waste is processed and prior to equipment maintenance, activated carbon replacement, or ion exchange resin replacement the TAN PWTU is flushed with 150 gallons of clean water. This flush forces any partially

treated wastewater through the system to make sure all the wastewater is completely processed and that no contamination remains in the piping. Therefore, no air emissions occur from equipment maintenance.

Onsite Laboratories

During periods of heavy use, a portable laboratory will be set up at the TAN PWTU. This laboratory will analyze up to 40 samples per day for organics using a gas chromatograph. The gas chromatograph will be vented to the atmosphere. Each sample will result in only 1 to 2 microliters of liquid being emitted to the atmosphere or less than 10 microliters per hour. At 100 mg/l of contamination, the maximum emission rate is 2×10^{-9} lb of contamination/hr or well below the emission standards given in Table B-1.

Process Waste Disposal

Process wastes from the TAN PWTU include spent activated carbon and ion exchange resins, and used prefilters. The contaminants in the activated carbon and resins are physically bound and will not be released during routine handling or transfer of the wastes. Therefore, no emissions occur from handling spent activated carbon or ion exchange resins. The carbon and the resins are currently disposed of at the Idaho National Engineering Laboratory as mixed and radioactive waste, respectively. The carbon will go to the Waste Experimental Reduction Facility (once available) and the resins will go to the Radioactive Waste Management Complex.

The prefilters contain contaminated solids and are bagged immediately after being removed from their housing in accordance with Department of Energy policy in containing radioactive wastes. Total exposure time to the atmosphere is less than 1 minute. No emissions to the atmosphere have been detected during the prefilter changeouts to date. The prefilters will be sent to the Waste Experimental Reduction Facility (once available).

Untreated Wastewater - Metal, Semi-volatile, and Radionuclide Contamination

The toxic metals, semi-volatile organics, and radionuclides in the wastewaters that will be treated at the TAN PWTU are typically at levels less than 100 mg/l. These low concentrations combined with the non-volatile nature of these contaminants indicate that air emissions from tanks or drums storing the untreated wastewaters will be negligible. In addition, the tanks or drums are typically sealed or covered until the water is processed further reducing the time the wastewater is exposed to the atmosphere.

Untreated Wastewater - Organic Contamination

The highest levels of air-borne organic contamination have been detected when drums of organic-laden wastewaters are first opened. Trichloroethylene (TCE) was used for the following analysis because field data exist on treating TCE wastewaters at the TAN PWTU, and because TCE is a highly volatile compound with a low emission standard.

For wastewaters with maximum levels of TCE of 30 mg/l and no other organics above 1 mg/l, maximum organic concentrations in the drum headspace have reached 400 part per million (ppm) as measured with field instruments. Within two minutes, these levels have dropped to 2 to 3 ppm. In comparison, levels measured in storage tanks have been at least four times lower than the levels measured in drums for wastewaters from the same source.

These field measurements can be used to determine the maximum emission rate for TCE (assuming all the organics measured are TCE) as follows:

- Based on 8 gallons per minute (gpm), the TAN PWTU can treat a maximum of eight 55-gal drums per hour.
- Typically, 2 inches of headspace is left in each drum as a precaution against overfilling or overpressurization of the drum. Two inches of headspace converts to approximately 0.41 cubic feet of air (2 inch x 1/12 ft per inch x 2.45 square feet (top of drum area)).
- At a standard air density of 0.0807 lb/cubic foot, 0.41 cubic feet equals 0.034 lbs or 0.015 Kg of air in the headspace (454 grams/lb, 1000 grams/Kilogram).

- 400 ppm = 400 mg of TCE/Kg of air.
- 400 mg/Kg x 0.015 Kg = 6 mg of TCE in the headspace/drum.
- 6 mg/drum x 8 drums/hr = 48 mg/hr or 1.1×10^{-4} lb/hr (454 gram/lb, 1000 mg/gram).

The drum as it is being emptied could release air with 2 to 3 ppm. Using calculations similar to those given above:

- 7.35 cubic feet of air per drum = 0.6 lb or 0.27 Kg of air at 0.0807 lb/cubic foot.
- 3 mg/Kg x 0.27 Kg/drum x 8 drums/hr = 0.64 mg/hr of organics.
- This increases the emission rate by only 1% and does not significantly impact the results.

The total emission rate for TCE from all TAN PWTU operations will therefore be 48 mg/hr or 1.1×10^{-4} lb/hr. The emission standard for TCE is 5.1×10^{-4} lb/hr or more than 4.5 times the projected emission rate.

Total Emission Rates from TAN PWTU Operations

Using the analyses given above, no air emissions of metals, semi-volatiles, or radionuclides will occur from the TAN PWTU. These contaminants are not volatile in nature, and the TAN PWTU process does not contain any operation that would increase or promote air emissions of these contaminants.

The greatest levels of air emissions will occur during processing organic-laden wastewater from 55-gal drums. The organic vapors in the drum headspace will be released to the atmosphere as the drum is opened. Field data show that the maximum emission rate for TCE is 1.1×10^{-4} lb/hr which is more than 4.5 times lower than the emission standard. Similar calculations would apply to other organics treated at the TAN PWTU.

Conclusion

Since the TAN PWTU does not release contaminants at levels above the emission standards, this unit meets the requirements of a Below Regulatory Concern determination for air emissions. Therefore, no air permit would be required under State of Idaho law.

Future compliance with State law will be maintained by regular monitoring of radionuclide and organic emissions from drums, tanks, and during operation. Also, practical limits on influent concentrations can be set by using the emission standards for the different contaminants.

Table B-1. Contaminants present in waters treated at the TAN PWTU[a]

Contaminants	Emission Standard, lb/hr
TCLP Volatiles	
Benzene	8.0×10^{-4} (c)
Carbon Tetrachloride	4.4×10^{-4} (c)
Chlorobenzene	23.3
Chloroform	2.8×10^{-4} (c)
1,4 Dichlorobenzene	30.0
1,2 Dichloroethane	2.5×10^{-4} (c)
1,1 Dichloroethylene	1.3×10^{-4} (c)
Methyl Ethyl Ketone	39.3
Pyridine	1.0
Tetrachloroethylene	1.3×10^{-2} (c)
Trichloroethylene	5.1×10^{-4} (c)
Vinyl Chloride	9.4×10^{-4} (c)
TCLP Semi-volatiles	
m-, o-, p-, total-Cresols	1.47
2,4 Dinitrotoluene	Detection Limit (c)
Hexachlorobenzene	1.3×10^{-5} (c)
Hexachlorobutadiene	3.3×10^{-4} (c)
Hexachloroethane	1.7×10^{-3} (c)
Nitrobenzene	0.333
Pentachlorophenol	0.333
2,4,5 Trichlorophenol	0.011
2,4,6 Trichlorophenol	1.2×10^{-3} (c)

Table B-1. (continued)

Contaminants	Emission Standard, lb/hr
TCLP Metals	
Arsenic	1.5×10^{-6} (c)
Barium	0.033
Cadmium	3.7×10^{-6} (c)
Chromium	0.033
Lead	Detection Limit
Mercury	0.003
Selenium	0.013
Silver	0.001
TCLP Pesticides and Herbicides	
Chlordane	1.8×10^{-4} (c)
2,4-Dichlorophenoxyacetic acid (2,4-D)	No Standard
Endrin	0.007
Heptachlor	5.1×10^{-6} (c)
Lindane	No Standard
Methoxychlor	0.667
Toxaphene	2.0×10^{-5} (c)
2,4,5-Trichlorophenoxypropionic acid (Silvex)	No Standard

Table B-1. (continued)

Contaminants	Emission Standard, lb/hr
Non-TCLP Organics	
Acetone	119
Bis (2-ethylhexyl) phthalate	2.8×10^{-2} (c)
Carbon Disulfide	2
1,2 Dichloroethylene	52.7
Methylene Chloride	1.6×10^{-3} (c)
Toluene	25
1,1,1 Trichloroethane	127
Xylenes	29
Radionuclides	
Cesium-137	(b)
Cobalt-60	(b)
Strontium-90	(b)
Tritium	(b)

a. General Summary of Idaho Air Quality Bureau's New Source Review Policy for Toxic Air Pollutants, January 1991, including Appendix A1 - Non-carcinogenic Toxic Air Pollutants, August 1, 1991 and Appendix A2 - Known or Suspected Carcinogenic Toxic Air Pollutants.

b. No standard is listed in the State New Source Review Policy. Federal law limits personnel exposure to airborne radionuclides to 25 mrem/yr as a combined total from all radionuclides present.

Note: (c) means the contaminant is carcinogenic.

Air Emissions from WAG 1 Operations - Hose Removal from the Injection Well and Sizing of the Decant Tank

Background

In January 1990, a pipe and hose were installed in the Technical Support Facility (TSF) injection well to remove contaminated sludge from the bottom of the well. The hose was used to inject compressed air into an air eductor at the bottom of the pipe forcing contaminated sludge and water up through the pipe and into an 8,000 gallon decant tank.

Planned Operations

A ventilated enclosure will be built to contain the following Waste Area Group One (WAG 1) operations at the Test Area North (TAN):

- Removal of the pipe and hose from the contaminated injection well at TAN. The carbon steel pipe is 2-in in diameter and 300 feet long. The hose is 1-in in diameter and is roughly 300 feet long. The primary contaminants on the pipe on expected to be trichloroethylene, tetrachloroethylene, cesium-137, strontium-90, tritium, and cobalt-60. The pipe will be cut up into 7 foot long sections for disposal. The hose will be cut into a 200 foot long uncontaminated section and a 100 foot long contaminated section (section below the water table).
- Size reduction of the 8,000 gallon decant tank so the contaminated metal can be disposed of at the Idaho National Engineering Laboratory.

The enclosure will be made of plastic and plywood around a wooden frame and will be roughly 30 feet long by 10 feet wide by 10 feet high. The enclosure will have a plastic floor and will be ventilated at 1,000 cubic feet per minute (cfm) through a HEPA filter. The decant tank has already been cleaned of hazardous contamination. During removal operations, the pipe and hose will be decontaminated with steam to remove hazardous contaminants while still within the well casing. The enclosure is being used to contain any releases of radiological contamination that might be on the metal surfaces.

Emissions from the Removal and Size Reduction Process

No hazardous or radioactive emissions are expected. However, it is possible that loose radioactive contamination on the outer surface of the pipe and in the pipe threads could fall off the pipe. This radioactive contamination could be released as the pipe is moved within the enclosure and when the pipe threads are broken. It is expected that this radioactive contamination will be in the form of wet, rust particles that will be relatively large and will rapidly settle out of the air. Any smaller particles will be captured in the HEPA filter. All hazardous contaminants will be removed from the pipe and hose by the steam decontamination procedure.

Emissions from the size reduction of the pipe, hose and decant tank will be limited to loose radioactive contamination released during cutting operations. Mechanical cutting tools (low speed snips) will be used to cut the metal, so radioactive particle releases will be limited to rust particles knocked off of the pipe/tank. These particles will be relatively large and will rapidly settle out of the air. Any smaller particles will be captured by the HEPA filter. Therefore, no hazardous or radioactive emissions are expected from this process.

Emissions from Enclosure Decontamination

Removal of loose rust particles and other debris on the floor/inner surfaces of the enclosure will be done while the ventilation system is still functioning. Any particles released into the air during this process will be contained by the HEPA filter. The interior of the enclosure will be surveyed for radioactivity before the enclosure is dismantled. Therefore, no hazardous or radioactive emissions are expected from this process.

Emissions from Operation of the Drill Rig and Portable Generator

A diesel-powered drill rig will be used to remove the hose and pipe from the injection well. This rig will be operated for roughly 40 hours over one week. A diesel- or gasoline-powered generator will be used to power the

cutting tool used to cut the pipe and tank. This generator will be operated for roughly 40 hours over a two week period. Emissions from both of these sources are not expected to exceed standards for operation of similar types of equipment in the field. Therefore, emissions standards will not be exceeded.

Total Emission Rates from Waste Area Group 1 Operations - Hose Removal and Sizing of the Decant Tank

Using the analyses given above, no air emissions of hazardous contaminants or radionuclides will occur from these operations. All removal and sizing work will be contained inside a ventilated enclosure with a HEPA filter. The metal particles that are expected to be generated will primarily be in the form of large rust particles that will settle quickly from the air.

Emissions from the diesel-powered drill rig and the diesel- or gasoline-powered generator are not expected to exceed standard emissions from similar types of equipment used in the field. Total emission times for these sources will be roughly 40 hours per source over 1 week for the drill rig and 2 weeks for the generator. Emissions standards will not be exceeded.

Conclusion

Since these operations will not result in the release of any hazardous or radioactive contamination or diesel/gasoline exhaust at levels above the emission standards, these operations meet the requirements of a Below Regulatory Concern determination for air emissions. Therefore, no air permit would be required under State of Idaho law.